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THE UNIVERSITY OF ALBERTA

# THE RED DEER REGION

by

ALAN MAURICE BAKER

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE

OF MASTER OF ARTS

DEPARTMENT OF GEOGRAPHY

EDMONTON, ALBERTA

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UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled The Red Deer Region submitted by Alan Maurice Baker in partial fulfilment of the requirements for the degree of Master of Arts.

Date ..October 17, 1962.....

ABSTRACT

Regional study of the Red Deer area was pursued within the framework of a functional region defined initially by the areal limits of three services provided to the region by the city of Red Deer. These services were daily newspaper circulation, fluid milk collection, and wholesale grocery distribution. The phenomena occurring within the region so defined were mapped, described, and interpreted with respect to the primary criterion of inter-relationship between city and region.

The region is about one hundred miles across, and is located mid-way between Edmonton and Calgary, the two major cities of Alberta, at the western edge of the plains of Western Canada. Red Deer, the nodal point of the region, is situated on the Red Deer River where it flows in its pre-glacial valley across a system of low ridges. The major transportation route between Edmonton and Calgary crosses the region in this valley.

The region is primarily agricultural in character, with a prosperous, stable, mixed farming economy, trending towards specialization in livestock and livestock products. Fertile chernozemic soils, developed on various glacially deposited materials, under parkland vegetation and a moist subhumid climate in the central part of the region are its most important natural resource.

During the past fifteen years trade and marketing pat-

terns within the region have focused increasingly upon Red Deer, enabling it to become a regional capital of significantly greater size and more diverse functions than the agricultural service towns which surround it. This change has been closely associated with the improvement of transportation facilities and the concentration of administrative, marketing, processing and distributive functions in Red Deer. During the same period extra-regional distribution has become established as a new function of Red Deer for reasons which are not entirely clear.

Development of the city and region are likely to continue at a high rate and in close relationships with one another upon the well-established agricultural base.

## ACKNOWLEDGEMENTS

In preparing this study I have been assisted by a number of people in Red Deer and its region whom I should like to thank for their willing cooperation and helpful advice. I am particularly grateful to Mr. Denis Cole, Director of the Red Deer District Planning Commission, for his analysis of the reasons for Red Deer's recent growth, and to Mr. R. D. Price, District Agriculturist in Red Deer, for his comments on current trends in agriculture in the region. I wish to thank Dr. William C. Wonders and Dr. A. H. Laycock for their encouragement and constructive criticism of the manuscript at its various stages. My thanks are due to Mrs. Germaine van Oene for typing the final copy. Finally, I wish to record my thanks to my wife for her assistance in the preparation of maps.

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# CHAPTER I

# INTRODUCTION

## 1. Theory of the Region

A discussion of the regional concept is essential at the outset of a regional study, both for the sake of clarity and because regional studies have fallen into some disrepute in recent years. Because of the variety of kinds of regions geographers have treated, it is necessary to clarify what is meant by "region" in a particular context. This variety and the lack of general agreement upon one regional concept have drawn criticism from, for example, George H. T. Kimble.[1] The acknowledged fact of variety is not, however, in itself a liability. It need mean only that the student of a region must select a valid concept which is suitable for his purpose. This selection is aided by the classification and discussion of regional concepts prepared by the committee of American geographers under the chairmanship of Derwent Whittlesey.[2] Within Whittlesey's classification the concept which most nearly describes the present study is that of the "nodal region". Richard Hartshorne suggests that the term "functional

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[1] George H. T. Kimble, "The Inadequacy of the Regional Concept," in L. Dudley Stamp and S. W. Wooldrige (eds.), London Essays in Geography, London, 1951, pp. 151-174.

[2] Derwent Whittlesey, "The Regional Concept and the Regional Method," in Preston E. James and Clarence F. Jones (eds.), American Geography - Inventory and Prospect, Syracuse, 1954, pp. 21-68.

region" is more appropriate for this concept,[3] and it is therefore used here.

It is not intended that a "geographic region" or a "compage" be defined in the Red Deer area, though there does appear to be a significant number of relationships which would support this approach. The concept of the "geographic region" is not adopted because it may lead to a forced coincidence of boundaries, and because no valid purpose seems to be served by attempts to include all areas in a universal scheme of "geographic regions". Such a scheme presumes a mechanistic framework which is alien to the facts of geography. For some areas of the earth's surface the concept of the "compage" seems more applicable than for others. It is easily applied to small islands, to certain areas having strongly marked physical boundaries, and to some areas where one form of fairly stable occupance has existed for a long time. But for an area such as the Canadian "Prairie" Provinces " compages" are extremely difficult to perceive on a manageable scale, and hence regional study can better proceed by the use of another concept. In this study the concept of the "functional region" has been chosen for reasons which will be stated at greater length in section 3 of this chapter.

One of the objections to regional studies, of whatever sort, has been the charge that they are unscientific and too subjective to be valid. A common result has been the

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[3] Richard Hartshorne, Perspective on the Nature of Geography, Chicago, 1959, p. 135.

choice of systematic treatment, often with great emphasis upon quantification of data. Systematic treatment, however, whether quantitative or not, is not less subjective than regional treatment, since the criteria must still be chosen by the student. "Such a system is logically merely a form of description reflecting subjective, or even quite arbitrary determination of what degrees of variation are important."[4] A methodology, no matter how refined, cannot ensure objectivity in any discipline; the more esoteric methodologies may conceal a lack of objectivity.

## 2. Choice of Study Area and Objectives

Initial interest in the Red Deer area was stimulated by personal knowledge of it from residence there; and a first attempt at regional study seems particularly to require as much field observation as possible.

Secondly, the rapid growth of the city of Red Deer since World War II makes it unique among the settlements of its size in Alberta (see Figures 1 and 2). This raises the question: is Red Deer's position changing in the central-place hierarchy of Alberta? And if so, how is this change related to the area surrounding Red Deer? What area is related to the city; what is the nature of the area and of the relationships?

Thirdly, an interest in city and regional planning

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[4] Ibid., pp. 132-33.

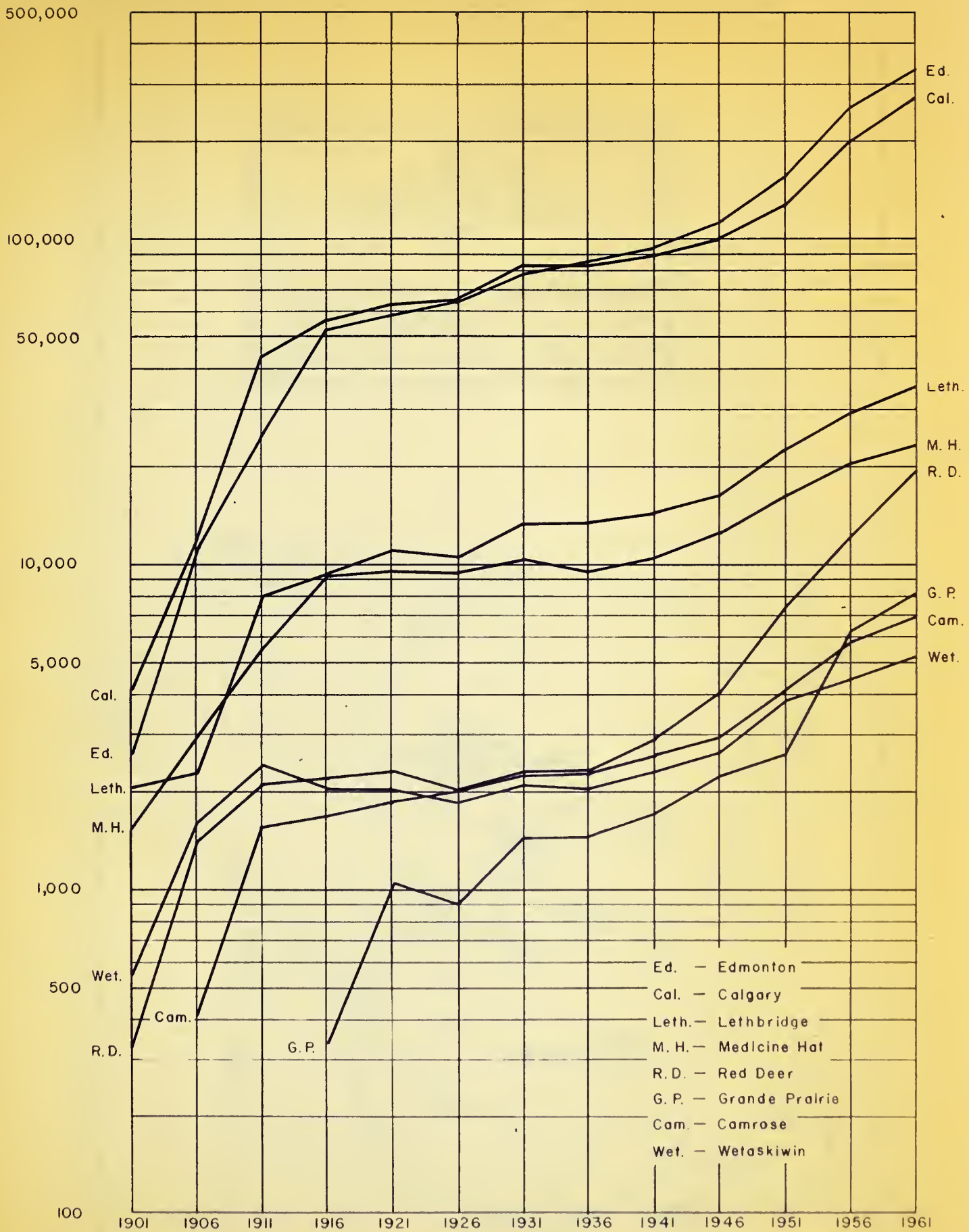
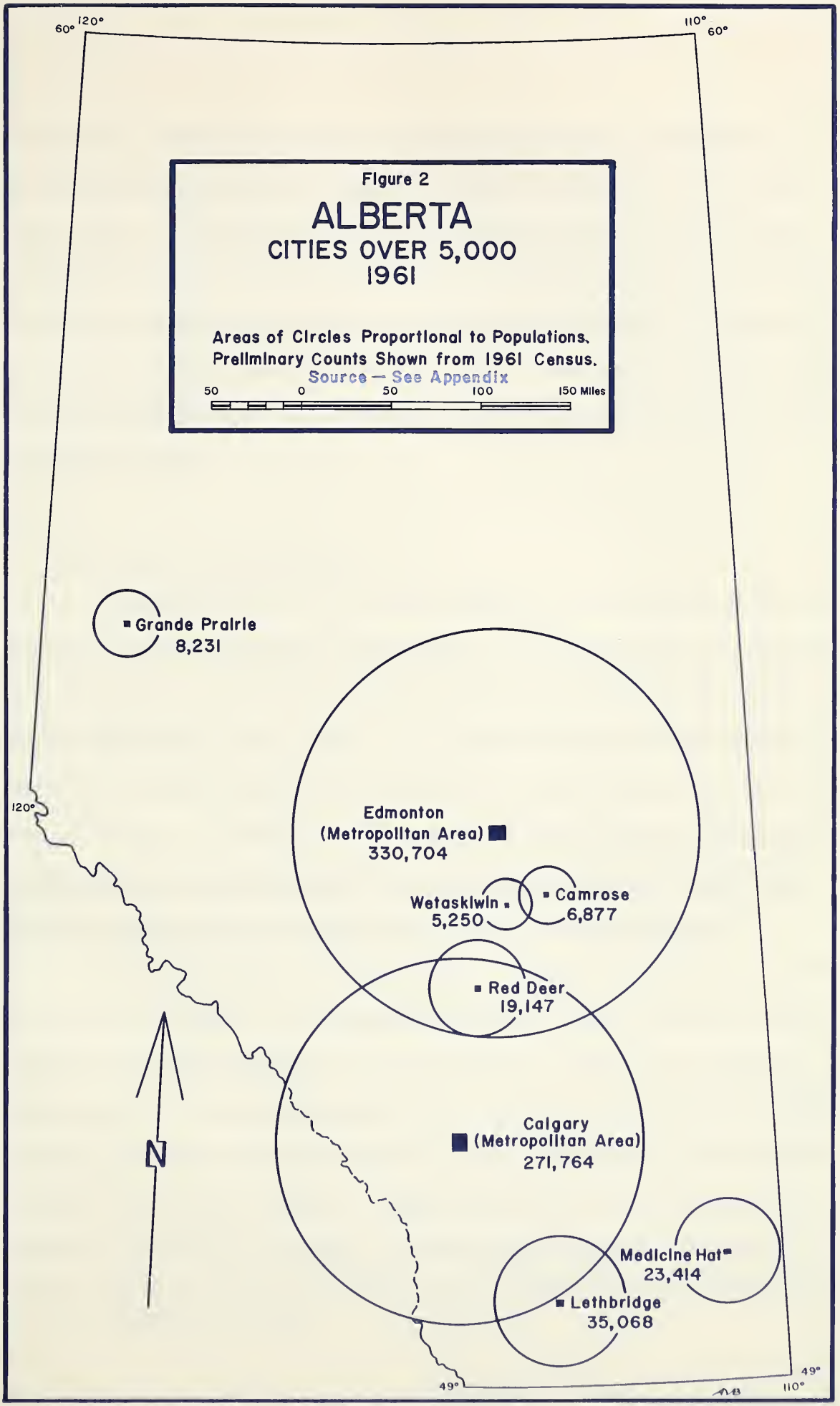



Figure 1 — POPULATION GROWTH OF ALBERTA CITIES OVER 5,000 IN 1961

Source — See Appendix


60°
120°
110°
60°
Figure 2
ALBERTA
CITIES OVER 5,000
1961
Areas of Circles Proportional to Populations.
Preliminary Counts Shown from 1961 Census.
Source — See Appendix
50
0
50
100
150 Miles
Grande Prairie
8,231
Edmonton
(Metropolitan Area)
330,704
Wetaskiwin
5,250
Camrose
6,877
Red Deer
19,147
Calgary
(Metropolitan Area)
271,764
Medicine Hat
23,414
Lethbridge
35,068
N
120°
49°
49°
110°

stimulated questions about the importance of city-regional relationships, answers to which might be sought in the Red Deer area. It should be stated here that no illusions are entertained about the possibility of doing regional studies for planning without first defining the planning objectives. Hence this aspect receives only minor treatment, and the study is considered to be a regional geographical study, not a planning study.

### 3. Criteria of the Region

Having stated the above reasons for attempting a regional study of the Red Deer area, it is necessary to choose and to state the criteria to be used in defining the region. As a definition it is useful to state Hartshorne's empirical conclusion regarding what geographers mean when they say they are studying a "region". "A 'region' is an area of specific location which is in some way distinctive from other areas and which extends as far as that distinction extends."[5]

Before study could proceed it was necessary to define the area of study. As suggested earlier, preliminary reconnaissance indicated that no "geographic region" was easily definable on a scale anywhere near that of the present study. Because of the concern with the city of Red Deer, the method of the "functional region" suggested itself. Investigation within this method showed a reasonable degree of correspon-

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[5] Ibid., p. 130.

dence in the areal extent of several kinds of functional inter-relationships between city and region.

The functions upon which these inter-relationships are based can be classified broadly into three groups: communication and administration; marketing and processing; and distribution. A significant example of each of these three groups was chosen for the purpose of mapping the extent of the region (see Figure 3). The significance of newspaper circulation as a regional criterion has been recognized by many geographers, so the example from the first group of functions is the percentage of households receiving the daily newspaper, the Red Deer Advocate. Secondly, marketing and processing functions are combined in the operations of the Central Alberta Dairy Pool's milk condensery at Red Deer; and the milk shed for the condensery[6] is a significant criterion for a region that is largely agricultural in character. The third group, the distributive functions, may be subdivided in many ways, retail trade areas often being considered to have most significance. However, the delimitation of retail trade areas requires a more detailed analysis than was warranted for a single part of this study. Also, Red Deer's position in the central place hierarchy is sufficiently high for it to have distributive functions beyond the scope of an agricultural service town such as those which surround it.

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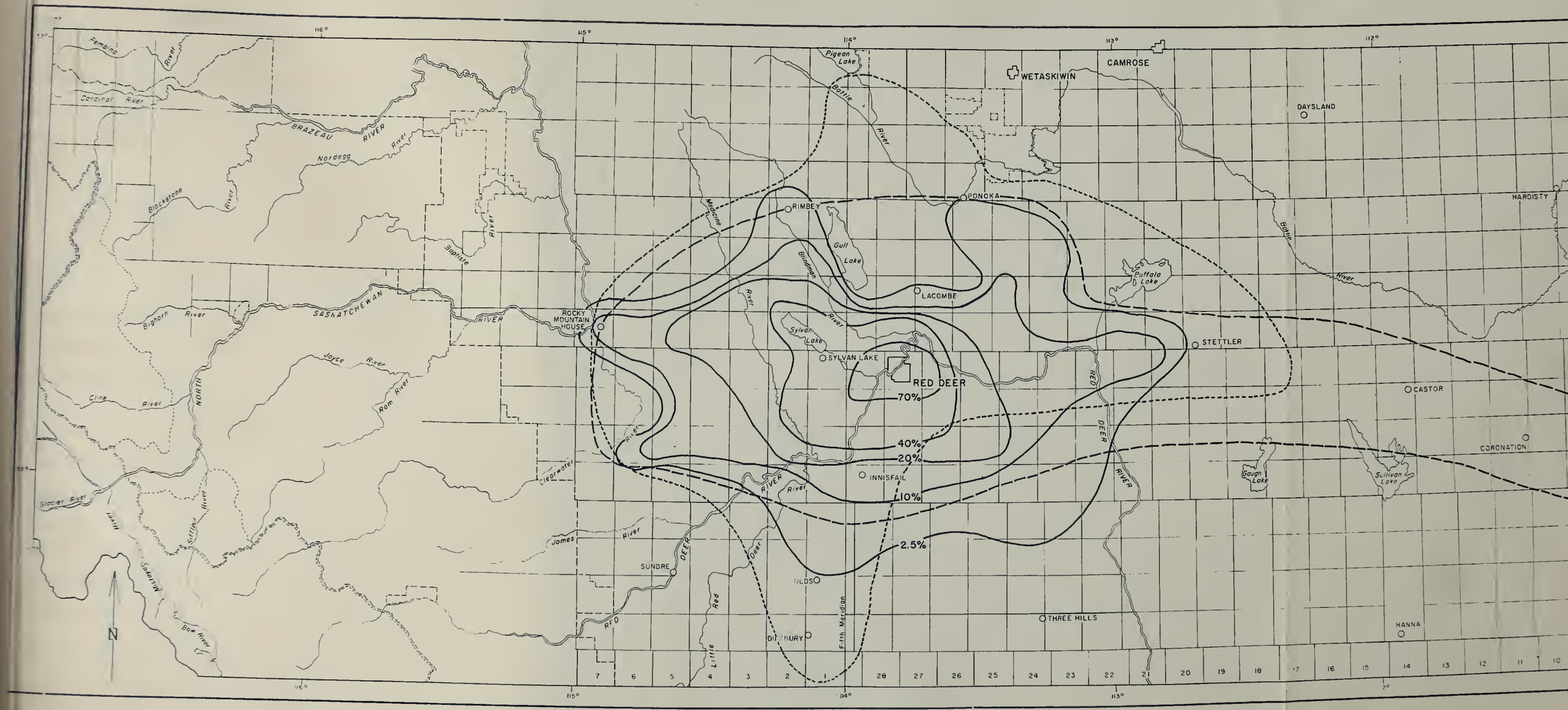
[6] It should be noted that this milk shed does not coincide with that for fluid milk consumed in Red Deer, which is a much smaller area.


116°
115°
114°
113°
112°
Pembina River
Central River
BRAZEAU RIVER
Nordegg River
Blackstone River
Saptiste River
Bighorn River
SASKATCHEWAN RIVER
Joyce River
Ram River
Cline River
NORTH RAVEN
Siffleur River
Siffleur River
Sheep River
Bow River
Clearwater River
James River
Pigeon Lake
Battle River
WETASKIWIN
CAMROSE
DAYSLAND
HARDISTY
Battle River
PONOKA
RIMBEY
Medicine River
Gull Lake
Blindman River
LACOMBE
Buffalo Lake
ROCKY MOUNTAIN HOUSE
Sylvan Lake
SYLVAN LAKE
RED DEER
70%
40%
20%
10%
2.5%
RED DEER RIVER
STETTLER
CASTOR
CORONATION
Gough Lake
Sullivan Lake
INNISFAIL
SUNDRE
OLDS
THREE HILLS
DIDSBURY
HANNA
Red Deer River
Little Red Deer River
Fifth Meridian
N
7 6 5 4 3 2 1 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10

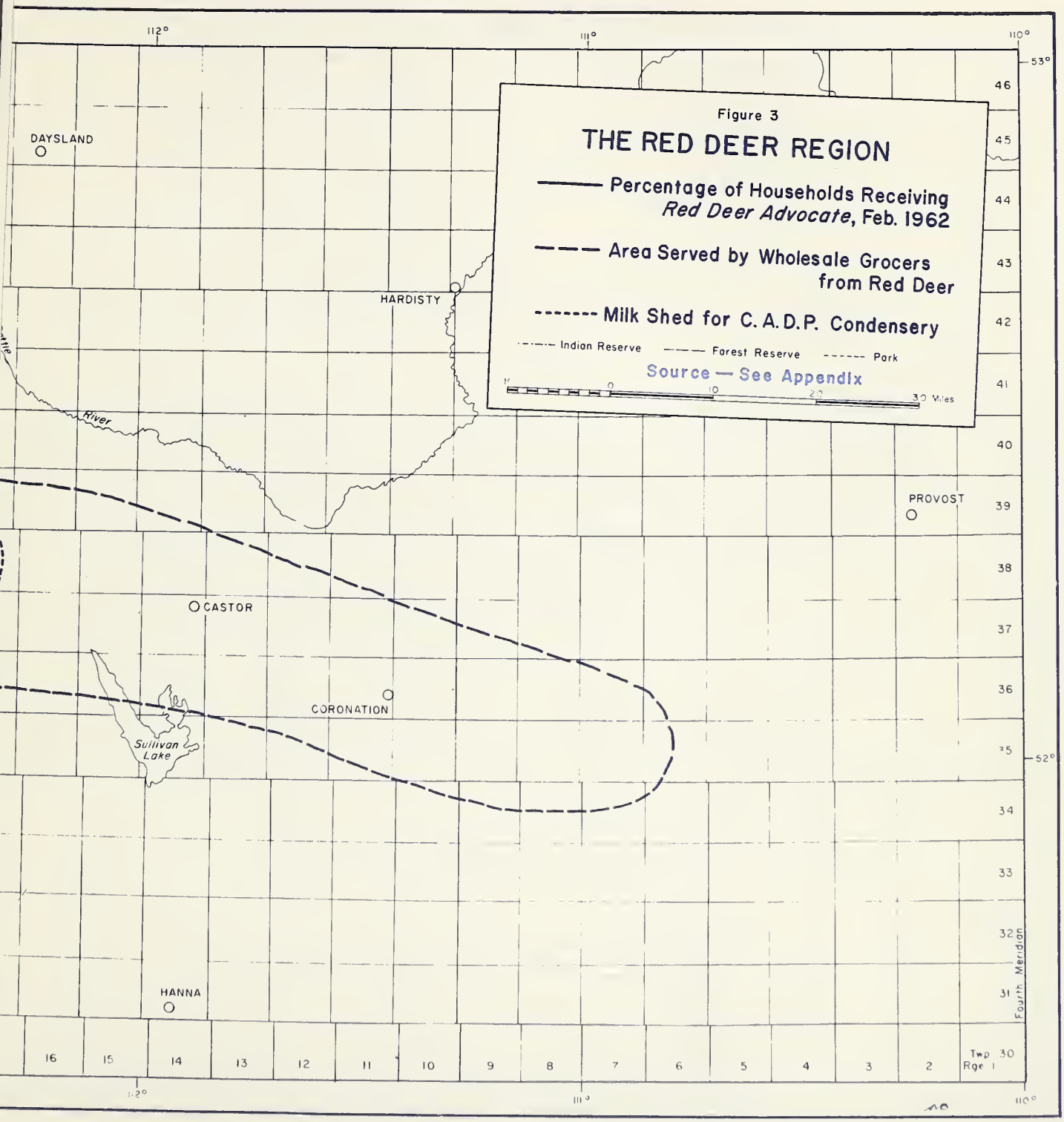


Figure 3
THE RED DEER REGION
Percentage of Households Receiving Red Deer Advocate, Feb. 1962
Area Served by Wholesale Grocers from Red Deer
Milk Shed for C. A. D. P. Condensery
Indian Reserve
Forest Reserve
Park
Source — See Appendix
0
10
20
30 Miles
112°
111°
110°
53°
52°
DAYSLAND
HARDISTY
PROVOST
CASTOR
CORONATION
HANNA
Sullivan Lake
River
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
Twp 30
Rge 1
Fourth Meridian

Of these functions the distribution of wholesale groceries was chosen as being both significant and clearly definable.

For the moment the three functions chosen are considered as significant examples by means of which to delimit the region. Red Deer's functions are considered in greater detail in Chapter VII.

## 4. Regional Definition

The term "the Red Deer region" is used in this study to mean the area delimited on Figure 3.[7] The patterns shown are not, of course, homogeneous, nor do the three boundaries coincide everywhere. But they do provide a region clearly and coherently defined for most of its extent, with zones of decreasing coherence rather than precise lines at the edges.

Many of the maps used show the Red Deer region in the setting of a larger area in order to show some significant features on its peripheries, and so that regional boundaries will not appear to have greater significance than they deserve. The term "Central Alberta" is used to describe this larger area bounded approximately by Township 46 on the north, Township 30 on the south, the fourth Meridian (the Alberta-Saskatchewan border) on the east, and the western boundary of the forest reserve on the west. "Central Alberta" is a

---

[7] The question whether regions are real or only concepts in the mind of the geographer is really a philosophical question better answered by a philosopher than by a geographer. It is sufficient to state here that the observed phenomena considered in this study are regarded as real.

term in common use in the study area, though it lacks definition as explicit as that stated above. For example, the Advocate calls itself "Central Alberta's Own Daily Newspaper", and the large producer co-operative for dairy and poultry products is called the "Central Alberta Dairy Pool". The geometric center of Alberta is somewhat north of Edmonton, so Central Alberta is not the central area of the province. The area is, however, relatively central in the population distribution of Alberta and central between Calgary and Edmonton, the two largest cities in the province (see Figure 2).

# CHAPTER II

## THE PHYSICAL BASIS

A clear understanding of the Red Deer region depends upon an understanding of the physical features of the region. As was suggested in Chapter I, no attempt is made to define a "geographic region", though variations in the different physical features are recognized within the region concerned. Interpretation of these physical features in relation to other features of the region is left largely to subsequent chapters.

The Red Deer region is located on the western margin of the central plains of North America, some 175 to 225 miles north of the Canada-United States boundary. To the west of the region are the foothills of the Rocky Mountains; to the east, the broad expanse of the Canadian "Prairies".

### 1. Geological Structure

The geological structure of the Red Deer region may usefully be viewed first of all as a part of the western Canadian plains, extending from the Mackenzie basin on the north to the international boundary on the south, and from the Canadian shield on the east to the Rocky Mountains on the west. J.B. Webb's description is clear and concise:

> This vast region, to which the name Alberta shelf has been applied, has constituted, since late pre-Cambrian time, a western extension of the great central North

> American craton of which the Canadian shield, on the east, has long remained the core. Numerous cycles of broad subsidence, marine or fresh-water sedimentation, emergence, and erosion occurred. During certain periods of marine transgression the plains region constituted a true submarine continental shelf with the low landmass of the Canadian shield on the east and northeast and the deeper waters of the Cordilleran, or in later time the Rocky Mountains, geosyncline on the west. Undoubtedly the Cordilleran trough received most of its great thickness of sediments from an orogenic belt farther west bordering the present Pacific coast, and the later Rocky Mountains geosyncline derived most of its deposits from the erosion of the Cordilleran geanticline, the great Nevadan orogenic uplift which, in Canada, gave rise to the Selkirk Mountain chain. However, it is reasonable to assume that during all periods of sedimentation on the shelf a considerable volume of fine clastics would be carried westward into these seas from erosion of the low landmass of the shield.[1]

Some of the lower formations of the bedrock structure which resulted from these periods of sedimentation are of significance for the production of oil and gas in the region. This subject is discussed in Chapter VI.

Of the formations which directly affect the land-surface of the Red Deer region, those of the Tertiary period are the most significant. Tertiary strata form the uppermost bedrock of the whole area from the northwest trending boundary between the foothills and the plains, to a roughly parallel line about a hundred miles to the east (see Figure 4). These strata, mostly Paleocene in age, were formed from fresh-water sediments deposited in the Alberta geosyncline. On its eastern margin the geosyncline dips gently westward. The dip in-

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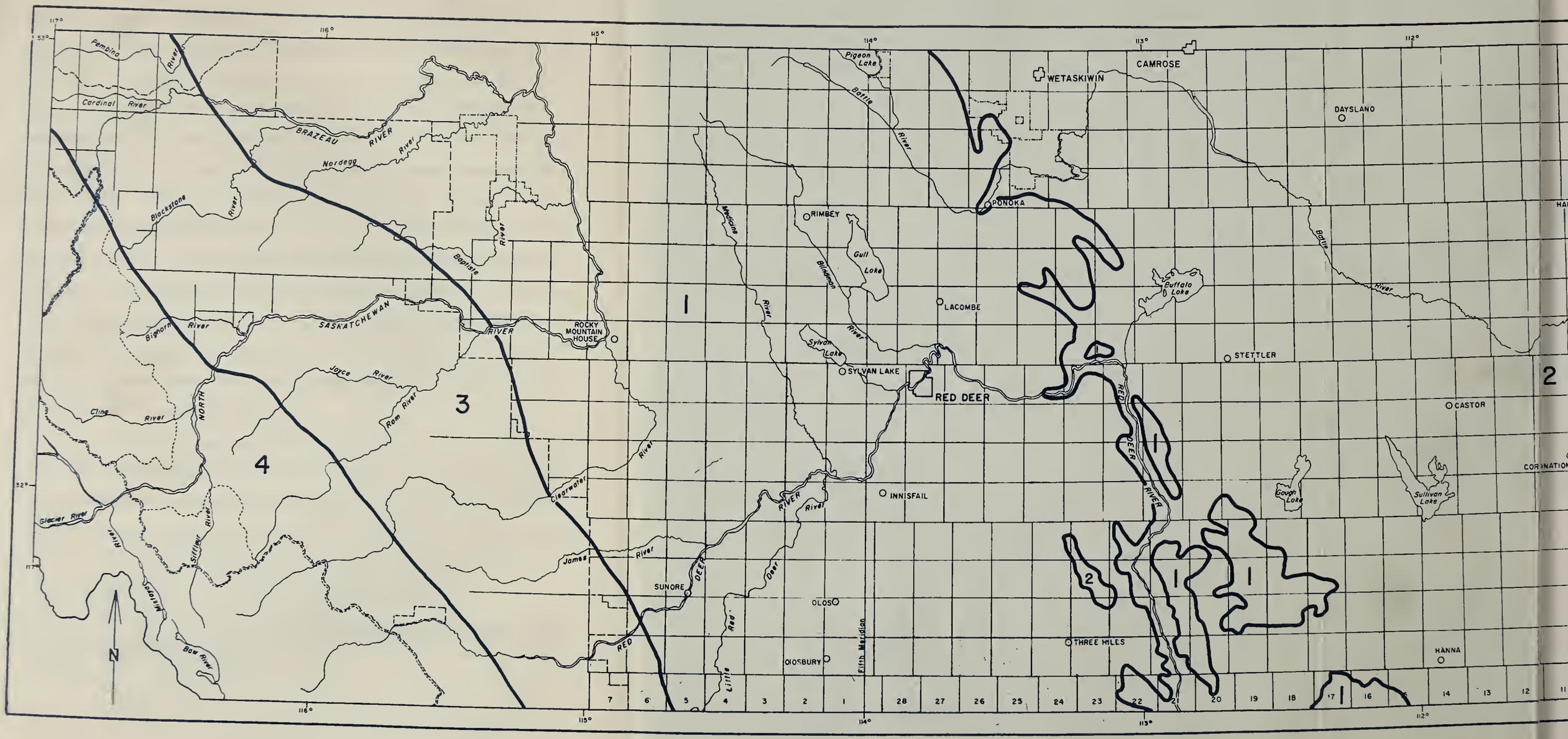
[1] J. B. Webb, "Geological History of Plains of Western Canada," in Leslie M. Clark (ed.), Western Canada Sedimentary Basin, Tulsa, 1954, pp. 3-4.


117°
116°
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114°
113°
112°
53°
52°
Pembina River
Cardinal River
BRAZEAU RIVER
Nordegg River
Blackstone River
Baptiste River
SASKATCHEWAN RIVER
Bighorn River
Joyce River
Ram River
Cline River
NORTH SASKATCHEWAN RIVER
Clearwater River
Glacier River
Siffleur River
James River
Ghost River
Sibbald Creek
Bow River
RED DEER RIVER
Little Red Deer River
ROCKY MOUNTAIN HOUSE
SUNORE
OLOS
OLOSBURY
INNISFAIL
RIMBEY
LACOMBE
SYLVAN LAKE
RED DEER
PONOKA
WETASKIWIN
CAMROSE
DAYSLAND
STETTLER
CASTOR
THREE HILLS
HANNA
Pigeon Lake
Battle River
Medicine River
Gull Lake
Billingon River
Sylvan Lake
Buffalo Lake
Gough Lake
Sullivan Lake
Fifth Meridian
N
1
2
3
4
7 6 5 4 3 2 1 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11

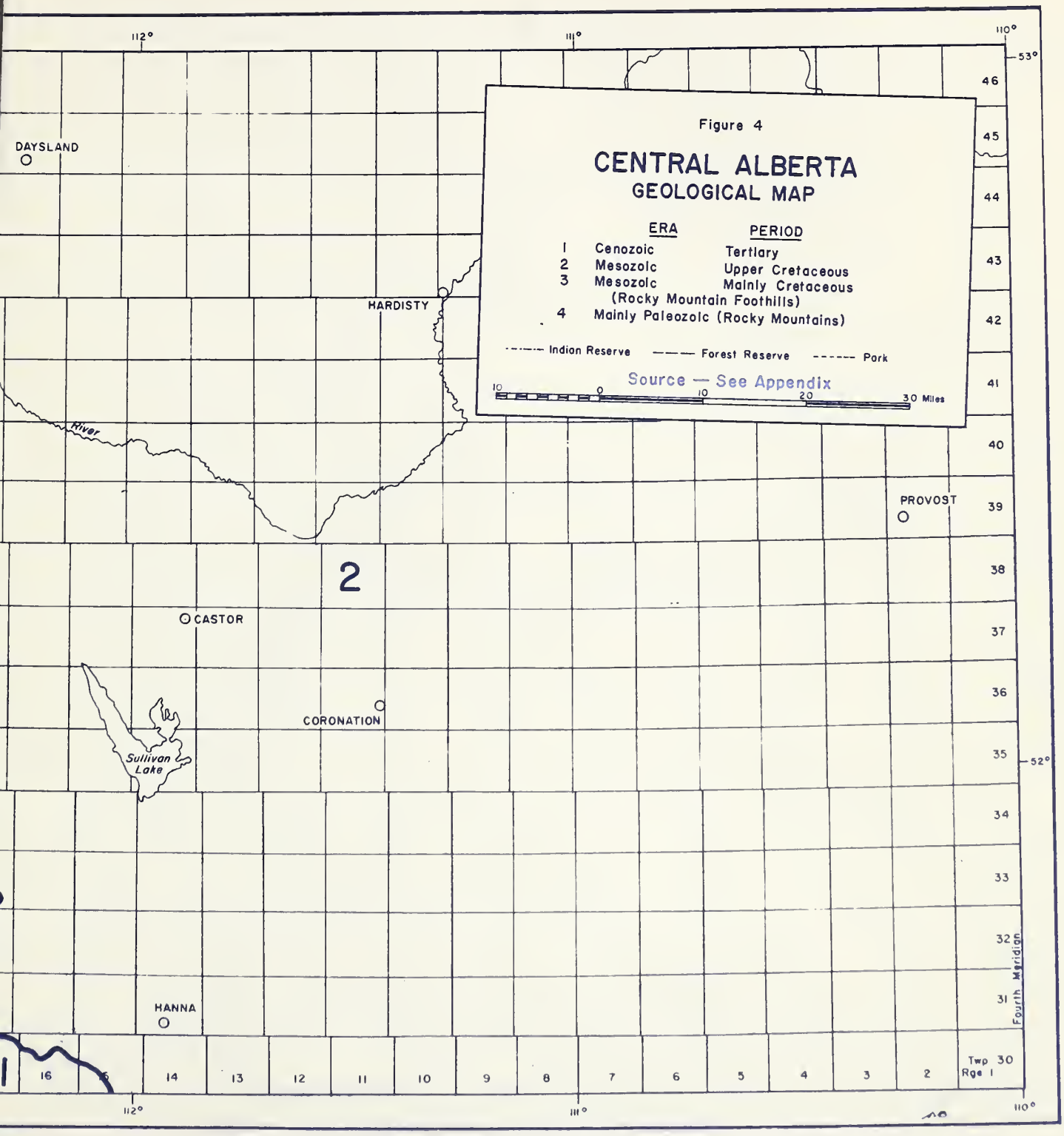
Figure 4
CENTRAL ALBERTA
GEOLOGICAL MAP
ERA
PERIOD
1 Cenozoic Tertiary
2 Mesozoic Upper Cretaceous
3 Mesozoic Mainly Cretaceous
(Rocky Mountain Foothills)
4 Mainly Paleozoic (Rocky Mountains)
Indian Reserve
Forest Reserve
Park
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
DAYSLAND
HARDISTY
River
PROVOST
2
CASTOR
CORONATION
Sullivan Lake
HANNA
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
16
14
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12
11
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7
6
5
4
3
2
Twp 30
Rge 1
Fourth Meridian

creases gradually toward the west until the maximum thickness of the Tertiary of 5,000 to 10,000 feet is reached near the margin of the foothills. The eastward dip of the geosyncline from the foothills is thought to be very steep, but the structure of this area is still a matter for investigation and speculation.[2] A much greater thickness of Tertiary beds was probably deposited and then eroded away, along with more recent strata. Of the younger Tertiary strata, the only remnant in Central Alberta lies on top of the Hand Hills, southwest of Hanna. The land-surface of the easternmost part of the Red Deer region is directly underlain by older formations of the Upper Cretaceous, which dip very gently westward in general conformity with the dip of the Alberta geosyncline, and which were deposited partly under marine conditions and partly under freshwater.[3]

Overlying the consolidated bedrock in much of the region are thin deposits of Tertiary and Early Quaternary alluvium consisting of "preglacial gravel and sand".[4] These deposits contain gravel and boulders up to twelve inches in dia-

---

[2]Theodore A. Link, "Interpretations of Foothills Structures, Alberta, Canada," Ibid., pp. 355-81.

[3]A. MacS. Stalker, Surficial Geology of the Red Deer-Stettler Map-Area, Alberta, Canada, Department of Mines and Technical Surveys, Geological Survey of Canada, Memoir 306, Ottawa, 1960, pp. 11-12.

[4]Ibid., p. 16.

meter "of rock types found in the mountains to the west",[5] as well as local bedrock, the imported rock types having been brought from the mountains by the pre-glacial Red Deer River and its tributaries.

The surficial material of the Red Deer region consists almost entirely of glacial materials deposited during the Wisconsin and other glaciations of the Pleistocene Epoch. The thickness of these surficial deposits exceeds 100 feet in only a few places, and varies from 10 to 30 feet in most parts of the region. In small areas the bedrock has been exposed either by glaciation or by subsequent erosion. In some river valleys recently deposited alluvium covers the glacial materials. Much of the till of the area consists of materials eroded from the local bedrock, mixed with materials from the Precambrian shield and some from the Cordilleran area.[6] The questions of the origins and the correct dating of the glacial materials in the area are extremely complex. It is apparent that both Laurentide[7] and Cordilleran ice contributed to the materials found in the region. Various attempts have been made to ascertain where the two ice sheets met (if they did), and whether they covered the

---

[5] Ibid., p. 17.

[6] Ibid., p. 73.

[7] For a discussion of the terminology appropriate to the glaciation of this area see Richard Foster Flint, "Growth of North American Ice Sheet During the Wisconsin Age," Bulletin of the Geological Society of America, Vol. 54, March 1, 1943, pp. 325-62.

same area at different times. The nature of the evidence which must be interpreted is illustrated by the train of huge quartzite erratics of Cordilleran origin lying east of the foothills margin.[8] These blocks, the largest of which is 60 feet long and is estimated to weigh 18,000 tons, may indicate a zone of meeting between Cordilleran and Laurentide ice, since it appears that both would have been necessary to transport them to their present locations. Other, more usual forms of evidence which must be interpreted are found in the stratification and composition of glacial tills. Most of the till is of comparatively local origin, and was deposited by Laurentide ice. (Further discussion of surficial materials is included below in Section 5 on soils.)

In this region of sedimentary rock, mineral fuels and building materials are almost the only minerals of economic significance. Oil and natural gas occur in stratigraphic and structural traps throughout most of the region. The fields are therefore fairly widespread, but of limited extent and generally short productive life. (The significance of oil and natural gas to the economy of the region is discussed in Chapter VI.) Extensive deposits of both lignite and sub-bituminous coal exist in the region, but little use is made of them because of the availability of other fuels, particularly oil and natural gas. The only deposits

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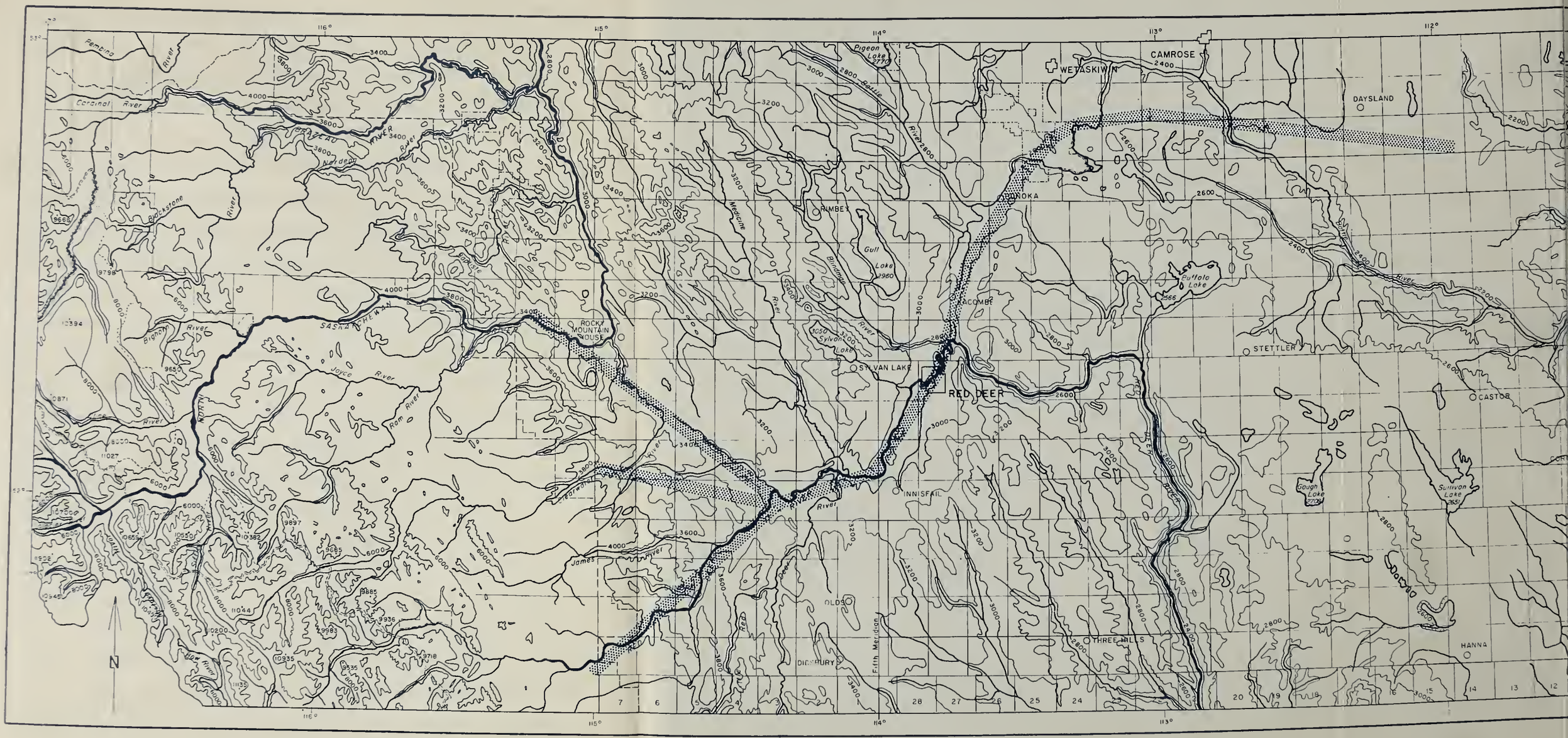
[8] A. MacS. Stalker, The Erratics Train, Foothills of Alberta, Canada, Department of Mines and Technical Surveys, Geological Survey of Canada, Bulletin 37, Ottawa, 1956.

now being worked within the region are in the upper cretaceous formations east of Red Deer, from which sub-bituminous coal is mined for use on farms and in small settlements not served by natural gas.

During the early period of Red Deer's growth, some local sandstone and locally made bricks were used for building in and around Red Deer. However, both stone and bricks are now imported from outside the region. Glacial gravels have long been used in road construction and for railway ballast, the most important single source in the region being the large deltaic deposit at the mouth of the Blindman Valley, 5 miles north of Red Deer. The alluvial deposits of the Red Deer River are the best source of gravel for concrete, and they are mined both inside the city of Red Deer and elsewhere along the valley.

## 2. Geomorphology and Drainage

The overall relief of the Red Deer region is about 1,500 feet. The lowest points are in the valley of the lower Red Deer River (Twp. 36, Rge. 22, W. 4 M.) and in the valley of a tributary of the lower Battle River (Twp. 38, Rge. 13, W. 4 M.), where elevations are less than 2,400 feet above mean sea level (see Figure 5). The highest points are in the Medicine Lodge Hills north of Sylvan Lake (Twp. 40, Rge. 2, W. 5 M.), where elevations are above 3,600 feet, and just south of the Clearwater River (Twp. 35, Rge. 6, W. 5 M.), where elevations are above 3,800 feet. The surface of the


116°
115°
114°
113°
112°
53°
52°
Pembina River
Cardinal River
Blackstone River
Brazeau River
Nordegg
Bighorn River
SASKATCHEWAN
Joyce River
Ram River
North Saskatchewan River
James River
Red Deer River
Medicine River
Blindman River
Gull Lake 2960
Pigeon Lake 2770
Battle River
Buffalo Lake 2566
Sylvan Lake 3050
Gough Lake 2605
Sullivan Lake 2651
Dogtail Creek
WETASKIWIN
CAMROSE 2400
DAYSLAND
RIMBEY
ROCKY MOUNTAIN HOUSE
SYLVAN LAKE
RED DEER
INNISFAIL
OLDS
DIDSBURY
THREE HILLS
STETTLER
CASTOR
HANNA
ACME
CROSSFIELD
5th Meridian
7
6
28
27
26
25
24
20
19
18
16
15
14
13
12
N

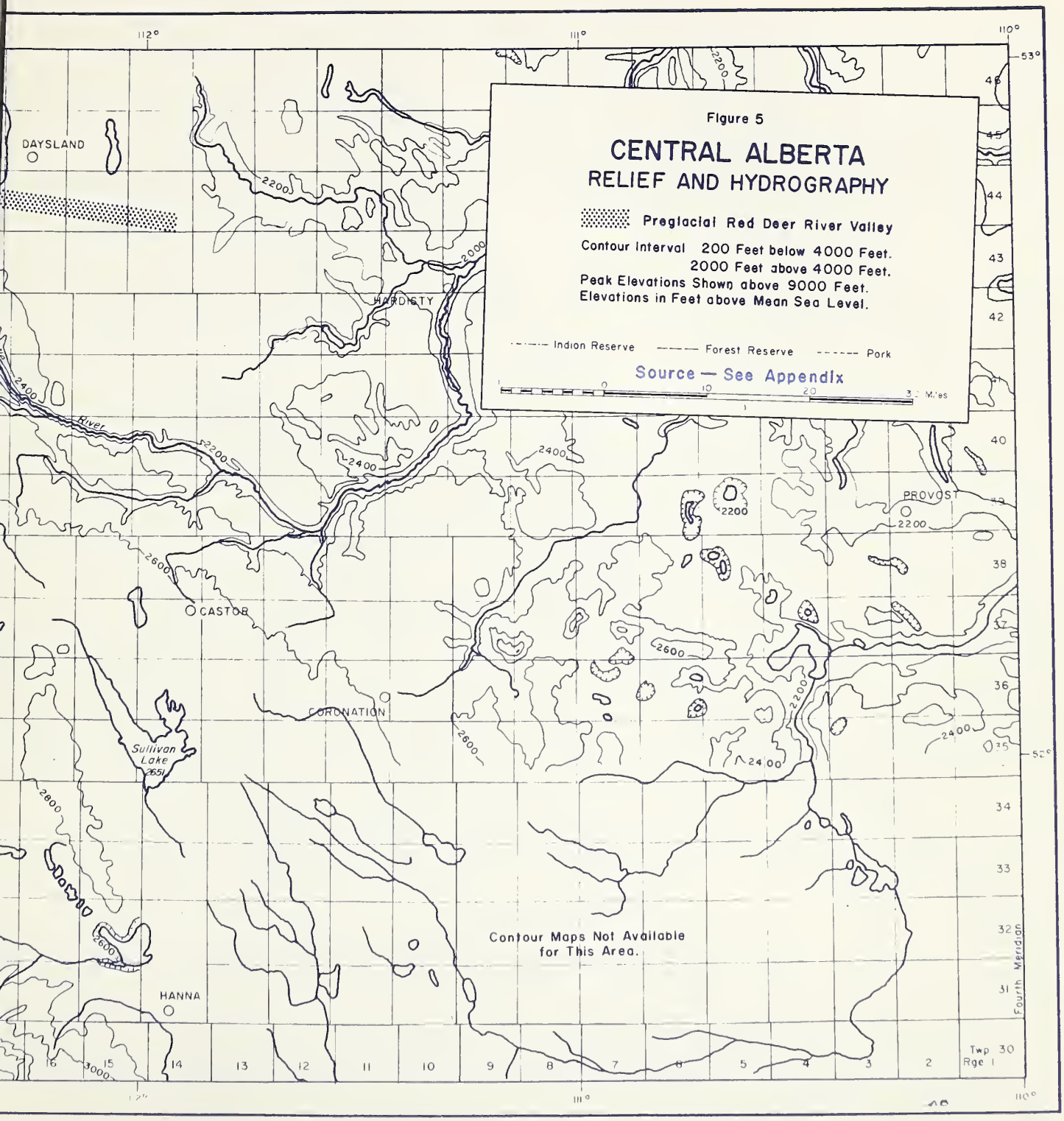
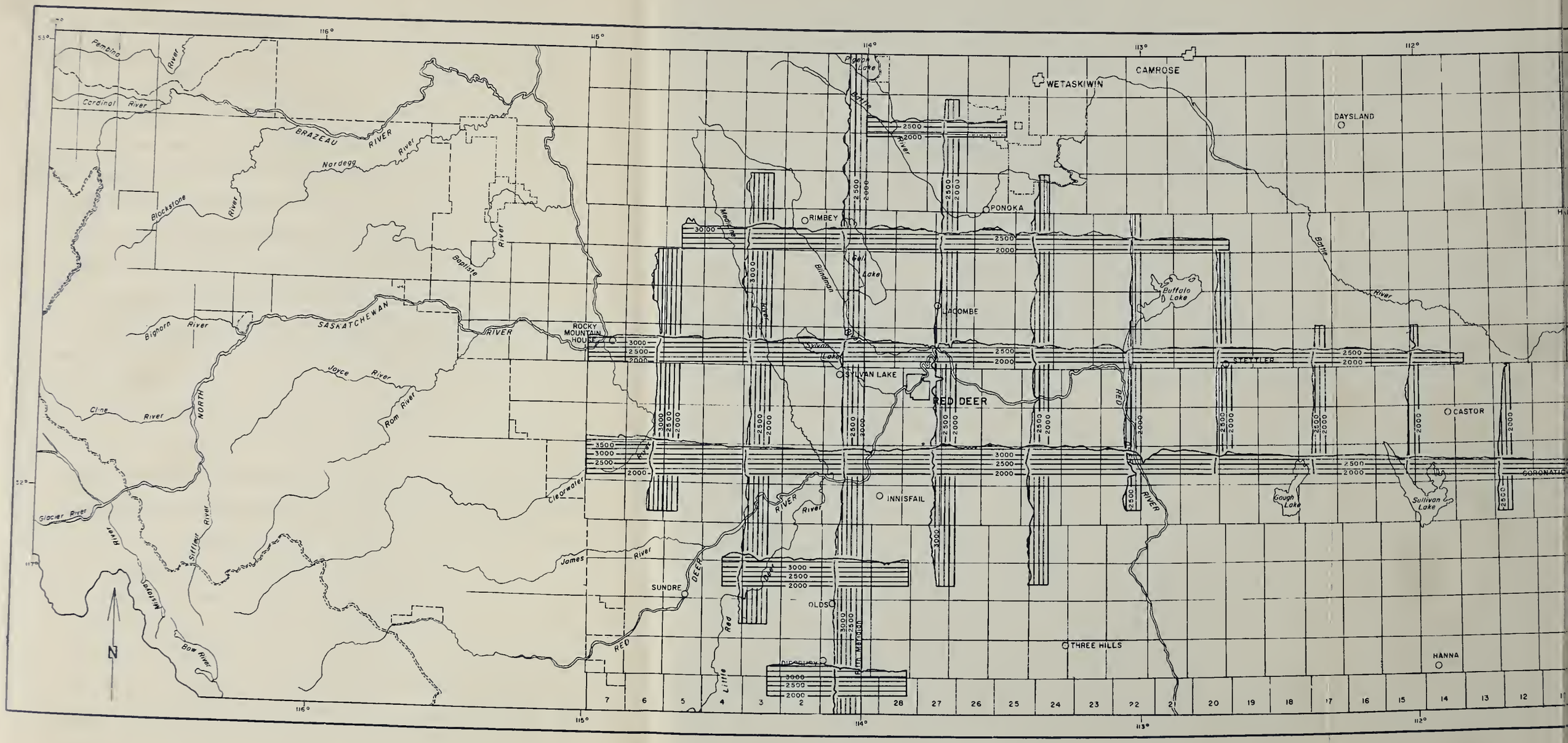


Figure 5
CENTRAL ALBERTA
RELIEF AND HYDROGRAPHY
Preglacial Red Deer River Valley
Contour Interval 200 Feet below 4000 Feet.
2000 Feet above 4000 Feet.
Peak Elevations Shown above 9000 Feet.
Elevations in Feet above Mean Sea Level.
Indian Reserve
Forest Reserve
Park
Source — See Appendix
0 10 20 Miles
DAYSLAND
HARDISTY
CASTOR
CORONATION
PROVOST
HANNA
Sullivan Lake
2651
Contour Maps Not Available for This Area.
Fourth Meridian
Twp 30
Rge 1
112°
111°
110°
53°
52°

region rises gently in a southwesterly direction at a gradient of about ten feet per mile (see Figure 6). Within the region local relief generally does not exceed 400 feet except for a few isolated hills and the valley of the lower Red Deer River. While much of the land is relatively flat or gently undulating there are, nevertheless, many areas of rolling and hilly land within the region. Some slopes are great enough to hinder mechanical cultivation or at least to make water erosion a problem, and great enough to cause difficulty in the routing of railways and to increase the cost of road construction. Thus the region is not a plains area in the sense of being very flat, though some very flat areas do occur. It may be characterized as a region of low ridges and shallow valleys, many of which are oriented in a north-northwesterly direction. The ridges are generally from 200 to 400 feet above the valley bottoms. The distances between the crests of the ridges vary from about two miles to as much as twenty miles in different parts of the region.

The major features of the landforms of the region are imposed by the bedrock.[9] In particular, the Tertiary formations of the central and western parts of the region are slightly more resistant than the Upper Cretaceous formations to the east. The resulting uplands and ridges are particularly apparent near the eastern margin of the area underlain by Tertiary formations (see Figure 4 and 5). In parts

[9] Idem., Surficial Geology of the Red Deer-Stettler Map-Area, pp. 5-6, 12.


116°
115°
114°
113°
112°
55°
22°
Pembina River
Cardinal River
BRAZEAU RIVER
Nordegg River
Blackstone River
Baptiste River
Bighorn River
SASKATCHEWAN RIVER
Joyce River
Cline River
NORTH RAM RIVER
Glacier River
Siffleur River
Clearwater River
James River
Bow River
Pigeon Lake
WETASKIWIN
CAMROSE
DAYSLAND
Battle River
RIMBEY
PONOKA
Medicine River
Blindman River
Gull Lake
LACOMBE
Buffalo Lake
ROCKY MOUNTAIN HOUSE
Sylvan Lake
SYLVAN LAKE
RED DEER
STETTLER
CASTOR
Gough Lake
Sullivan Lake
INNISFAIL
SUNDRE
DEER RIVER
Little Red Deer River
OLDS
THREE HILLS
HANNA
RED DEER RIVER
3500
3000
2500
2000
7
6
5
4
3
2
28
27
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12

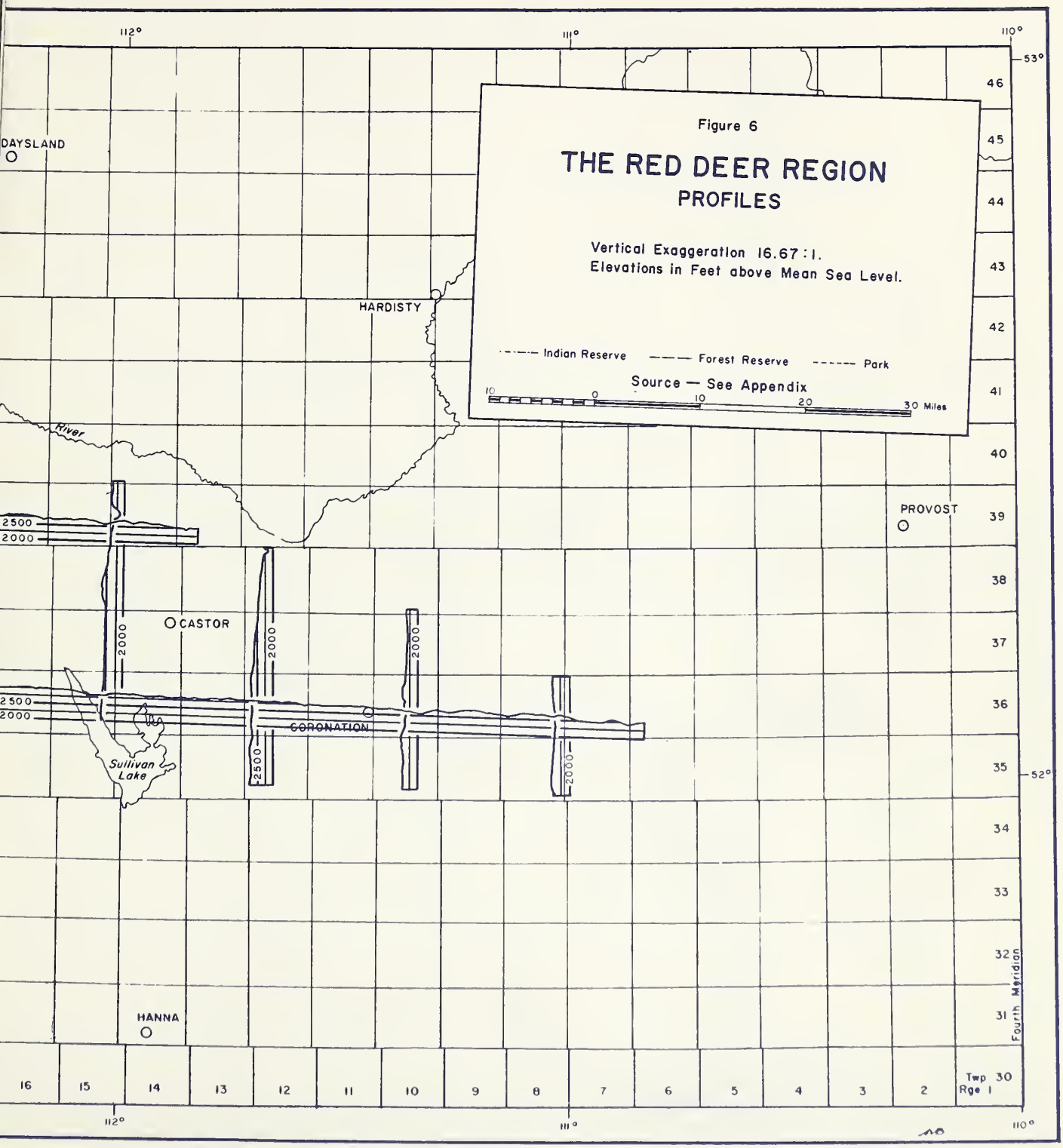
Figure 6
THE RED DEER REGION
PROFILES
Vertical Exaggeration 16.67 : 1.
Elevations in Feet above Mean Sea Level.
Indian Reserve
Forest Reserve
Park
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
DAYSLAND
HARDISTY
PROVOST
CASTOR
HANNA
CORONATION
Sullivan Lake
River
2500
2000
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
Twp 30
Rge 1
Fourth Meridian

of this area the general slope of the land conforms approximately to the southwestward dip of the Tertiary strata, thus running counter to the slope of the region as a whole. This effect is illustrated by an east-west profile through Township 36 just north of Innisfail (see Figure 6). In other parts of the region, for example between Gull Lake and Pigeon Lake, Tertiary beds form prominent ridges. Pre-Wisconsin stream erosion carved the essential pattern of the major geomorphic features, which was then modified by glacial erosion and deposition. While glacial processes lowered some of the ridges and partly filled some of the valleys, glaciation did not eradicate the pre-Wisconsin features. In this region the Wisconsin-Laurentide ice-sheet is thought to have been relatively thin, and Cordilleran ice probably existed here only as valley and piedmont glaciers rather than as a continuous ice-sheet.[10] Hence, though the whole region was glaciated during the Wisconsin, in many places the flow of ice was partially directed by the pre-Wisconsin landforms. Pre-glacial landforms probably played a similar role during some of the earlier stages of the Pleistocene.

The present valley of the Red Deer River is the most striking physical feature in the region, and the pre-glacial valley of the Red Deer--still occupied in part by the river (see Figure 5)--is one of the most significant physical features. The Red Deer and its tributaries drain most of the region. In the west the North Saskatchewan River system

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[10] Ibid., pp. 67-73.

drains a small part of the region, and in the north and east the Battle River system drains a minor part of the region. (Some areas in the southeast have internal drainage.) Both of these latter systems were once united with the Red Deer system in one major system draining much of the region as well as large areas to the west. In his detailed discussion of the pre-glacial and present drainage patterns of Central Alberta, Stalker states:

> The valley of the former Red Deer River within the Red Deer-Stettler area[11] is a typical preglacial valley. This was the major valley within this map area, and it drained a much greater area in western Alberta than does the modern stream. The Clearwater River, other present tributaries to the North Saskatchewan River farther north, and even the headwaters of the North Saskatchewan itself, may have been tributary to the preglacial Red Deer.[12]

The river eroded a broad valley, from five to twenty miles wide, with gently sloping sides. Several cycles of rejuvenation occurred, and during the later stages of these cycles many deposits of sand and gravel were laid down. The pre-glacial valley was traced by Stalker from a study of all available information on surficial deposits and from a study of relief. The contours of the pre-glacial valley are apparent in the present landforms as far "downstream" as Ponoka, and the valley's form may be observed in profiles of the same area.

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[11] Stalker's primary concern in this work is with the Red Deer-Stettler map area, bounded by lat. 52 and 53°N, and long. 112 and 114°W, including approximately Twp. 35 to 46, Rge. 15 to 28, W. 4 M.

[12] Ibid., p. 55.

Immediately north of the city of Red Deer the river was diverted from its northward course to its present eastward course by ice-blockage of the pre-glacial valley. It is difficult to fix the time of the diversion, but both Stalker and Bretz[13] agree that it was pre-Wisconsin. Stalker calls the diversion "the most important single effect of the Pleistocene glaciation in the area".[14] East of the diversion the river now runs in a narrow, steep-sided valley that is incised more than 600 feet into the Paskapoo beds of the Tertiary upland at their highest point. About fifteen miles east of Red Deer the river enters the weaker Edmonton beds of the Upper Cretaceous. For the next ten miles the valley is a little broader and only about 200 feet below the adjacent upland, from which the Tertiary formations have been removed. In this section are located the only railway and highway crossings of the river in its hundred-mile course between the cities of Red Deer and Drumheller. In the southeastern part of the region the river flows southward in a youthful valley which is parallel to the strike of the bedrock and incised as much as 600 feet into the easily-eroded beds of the Edmonton formation of the Upper Cretaceous. This portion of the valley forms a major barrier to both rail and road transportation routes.

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[13] J. H. Bretz, "Keewatin End Moraines in Alberta, Canada," Bulletin of the Geological Society of America, Vol. 54, Jan. 1, 1943, p. 51.

[14] Stalker, op. cit., p. 58.

None of the other streams in the region is so important to the geography of the region as is the Red Deer, but some are of local significance. Several of these, such as the Blindman and the Medicine Rivers, appear to flow in pre-glacial courses. Others, such as the Battle River, occupy glacial spillway channels in parts of their courses. Most of the smaller stream valleys, however, are extremely youthful in form, and the drainage system is still in the early stages of post-glacial re-integration. In some areas it is reasonably well developed, but in others, such as those around Buffalo and Gough Lakes, surface drainage is into local depressions and surface flow to major streams is very local and intermittent. A notable feature of the drainage pattern of the region is the northwest-southeast orientation of many of the streams. Some of the valleys are known to be controlled by bedrock; others are former glacial spillway channels; the origin of others is not known.[15]

Lakes are almost entirely absent from the western and southwestern parts of the region where heavier precipitation and steeper slopes have hastened the development of the drainage system. In the central part Pigeon Lake, Gull Lake, and Sylvan Lake occupy shallow basins oriented in the direction of strike of the underlying bedrock. Some ridges, such as the one just northeast of Sylvan Lake, and the lake basins may be bedrock controlled. In the eastern part of the

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[15] Ibid., pp. 62-63.

region lakes are more numerous and show no general pattern of orientation. Two of the larger ones, Gough Lake and Sullivan Lake, and many of the smaller ones have no surface outlets, and Buffalo Lake has surface outflow only at periods of high water. Most of the lakes of the region, especially those in the east, show marked fluctuations in level from year to year, and these fluctuations are reflected in varying shorelines because of the shallowness of their basins. Many lakes and sloughs are intermittent as are many of the streams. Sullivan Lake, for example, normally occupies about fifty square miles, but was dry in 1937 after a long period of drought.[16] Many of the lakes are alkaline because some of the underlying materials originated as marine sediments and because water loss is mostly by evaporation and seepage.

The less prominent surface features of the region are in general those produced by glaciation, with some local modification by the subsequent action of water and wind. The most extensive glacial deposits in the region are composed of ground moraine, which covers about half of the region as well as underlying other types of deposits. "The ground moraine is generally less than 20 feet thick, and its surface is typically rolling with broad, rounded hills rising 2 to 15 feet above the nearby depressions."[17] As was suggested

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[16]F. A. Wyatt et al., Soil Survey of Sullivan Lake Sheet, University of Alberta Bulletin No. 31, Edmonton, 1938, p. 9.

[17]Stalker, op. cit., p. 19.

earlier, the till originated largely in the bedrock of the area, but contains an admixture of boulders and finer materials from both the Canadian Shield and the Rocky Mountains. The ground moraine is typically located in areas of middle elevations rather than in the valley bottoms or on the tops of ridges. In a considerable portion of the region the ground moraine has been modified by water from the melting ice-sheets. Where such modification occurred the water washed the finer materials from the tops of the hills into the depressions, or deposited a thin layer of alluvial or lacustrine materials over the till. Areas of water-modified ground moraine occur typically at lower elevations than the unmodified deposits, just above the valley bottoms. Other morainic deposits of a hilly nature, including knob-and-kettle terrain, are grouped by Stalker under the term hummocky moraine.[18] The term is useful since it groups together morainic deposits of different origins which produce similar landscapes. The group includes deposits which have been called recessional, terminal, or end moraines; and dead-ice moraine or stagnant-ice deposits. Hummocky moraine occurs typically in areas of higher elevation, particularly the Tertiary upland to the east of Red Deer. In addition some water-modified hummocky moraine occurs at lower elevations, for example around Buffalo Lake. Both types of hummocky moraine are generally composed of the same material as the

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[18] Ibid., p. 3.

ground moraine, but with the finer particles commonly removed and local deposits of sand and gravel added.

Materials deposited by glacial meltwater cover about one-quarter of the region and are of considerable economic significance, either as sources of gravel or as parent materials of soils. During deglaciation the margin of the ice-sheet retreated generally in a northeasterly direction, chiefly through the process of downmelting. "The limiting of ice on the west and south by rising land, rather than by downward slope of the ice surface, was chiefly responsible for the large amount of ice stagnation during retreat of the last glacier from the region."[19] Water was ponded between the ice and the higher, ice-free land to the southwest. In addition, many lower areas were occupied by isolated remnants of ice long after the higher areas were free of ice, and the melting of these remnants added to the glacial lakes. The large number of glacial spillways at different elevations indicates that several different glacial lakes existed at various stages of deglaciation. Probably all of the flatter areas in the region were occupied by glacial lakes at one time or another. Because the lakes remained at given levels for only relatively short periods of time, beach ridges did not have time to develop to any extent. Delta deposits occur, for example where the Blindman River flowed into glacial Lake Red Deer. In this area (Twp. 39, Rge 27, W. 4 M.) ap-

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[19] Ibid., p. 74.

proximately six square miles of deltaic gravel occur at the surface or under dune sand. Outwash deposits occur in small areas throughout much of the region, generally in combination with hummocky moraine.

Lacustrine deposits are by far the most widespread of the materials deposited by glacial meltwater. They vary from small, local deposits to some of many square miles. The distribution of the larger areas may be inferred from the distribution of soil parent materials of lacustrine origin (see Figure 7), though water also covered other extensive areas where it modified the ground moraine and hummocky moraine as mentioned earlier. The most extensive areas of lacustrine deposits are the large plain southeast of Rocky Mountain House; the Medicine River valley; the pre-glacial valley of the Red Deer River, which was occupied by glacial Lake Red Deer as far north as Ponoka at some stages; and part of the land occupied by glacial Lake Malmo, which extended south from Wetaskiwin into the northern part of the region. The composition of the deposits includes sand and silty sand, deposited under moving water; and silt and clay, deposited under relatively still water. In general, the coarser materials tend to predominate, though any one area may contain all sizes of particles. Areas of lacustrine deposition are of course generally flat or only very gently sloping.

Post-glacial wind action has been important in two respects: the transportation and deposition of sand and

Detailed Soil Survey Not Available for This Area.

Not Explored

Soil Survey

WETASKIWIN
CAMROSE
DAYSLAND
RIMBEY
PONOKA
LACOMBE
STETTLER
SYLVAN LAKE
RED DEER
CASTOR
SUNDRE
OLDS
DIDSBURY
THREE HILLS
HANNA
ROCKY MOUNTAIN HOUSE

Imbina River
Cardinal River
Brazeau River
Vordegg River
Blackstone River
Baptiste River
Bighorn River
Saskatchewan River
Joyce River
Cline River
North Ram River
Pigeon Lake
Battle River
Gull Lake
Buffalo Lake
Sylvan Lake
Red Deer River
Gough Lake
Sullivan Lake
Glacier River
Siffler River
Mistaya River
Bow River
James River
Threepoint Creek
Little Red Deer River
Fifth Meridian
Medicine River

6 5 4 3 2 1

7 6 5 4 3 2 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12

117° 116° 115° 114° 113° 112°

53° 52°

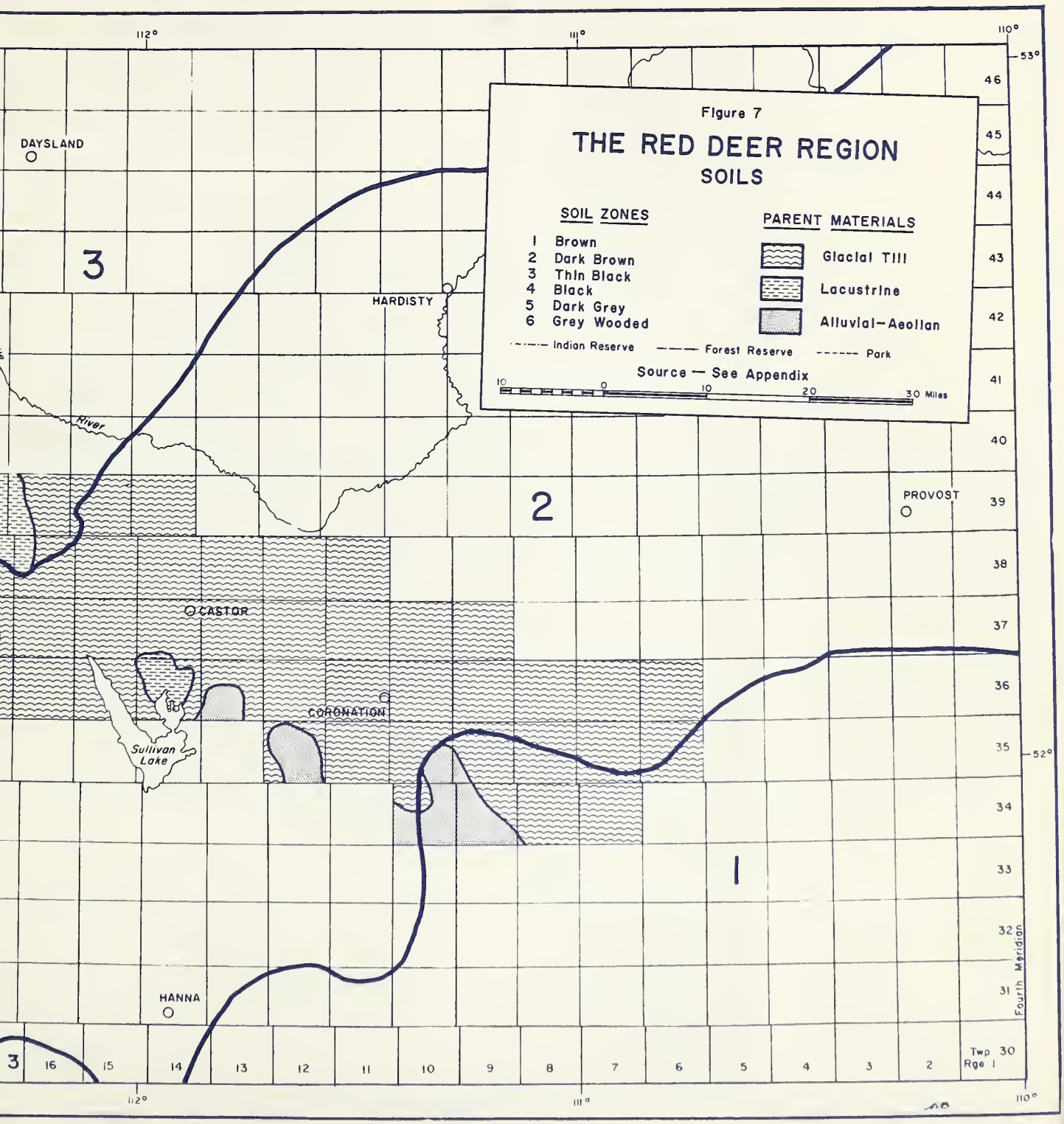
Figure 7
THE RED DEER REGION
SOILS
SOIL ZONES
1 Brown
2 Dark Brown
3 Thin Black
4 Black
5 Dark Grey
6 Grey Wooded
PARENT MATERIALS
Glacial Till
Lacustrine
Alluvial–Aeolian
Indian Reserve
Forest Reserve
Park
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
DAYSLAND
HARDISTY
PROVOST
CASTOR
CORONATION
Sullivan Lake
HANNA
River
Fourth Meridian
Twp 30
Rge 1
1
2
3
46
45
44
43
42
41
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37
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2

coarse silt into dunes, and the sorting of sandy and silty materials over extensive areas. Both processes tend to occur in areas of deposition by glacial meltwater where coarser textured materials are available. Dunes cover small areas fairly widely dispersed in the central and eastern parts of the region. Examples are found on the northern edge of the city of Red Deer, just north of the mouth of the Blindman River, and just southwest of Ponoka. Except in the drier eastern areas, the dunes are now stabilized by vegetation. Removal of the vegetation, however, may result in renewed drifting, as observed in Red Deer late in 1961. The process of wind sorting of materials over extensive areas has not resulted in any significant alteration in the landform, but has produced concentrations of sandy and silty soil parent materials which are subject to renewed wind erosion when under cultivation.

The region as a whole contains no geomorphological boundaries which mark it off and distinguish it clearly from other regions. However, the apparently minor ridges and valleys which characterize the region have significantly affected the orientation of transportation routes. The pre-glacial valley of the Red Deer River, cutting across the northwest-southeast trending system of ridges, is the best location for north-south routes through the region. (See Chapter IV - Transportation Facilities.) The Red Deer River and its present valley give the city of Red Deer significant advantages of site over other settlements in the region. Red Deer is

the only major settlement in the region situated on a river from which it can draw adequate supplies of water for domestic and industrial use. Other settlements are dependent upon ground water of more limited quantity and poorer quality, or upon smaller and less reliable streams. Red Deer's valley site is also more attractive than those of most other settlements in the region.

3. Climate

The mean annual precipitation in Central Alberta[20] varies from less than fourteen inches in the southeast to more than twenty-four inches in the southwest (see Figure 8). Precipitation originates largely in cyclonic storms moving eastward from the Pacific, though summer thunderstorms are not uncommon. Its distribution in Central Alberta is strongly affected by the Rocky Mountains to the west. Most precipitation falls as rain during the summer months. Small amounts of summer precipitation occur in the form of hail. Hail storms cause significant damage to crops in parts of Central Alberta during most years, though the pattern varies from year to year.[21] Winter precipitation is relatively

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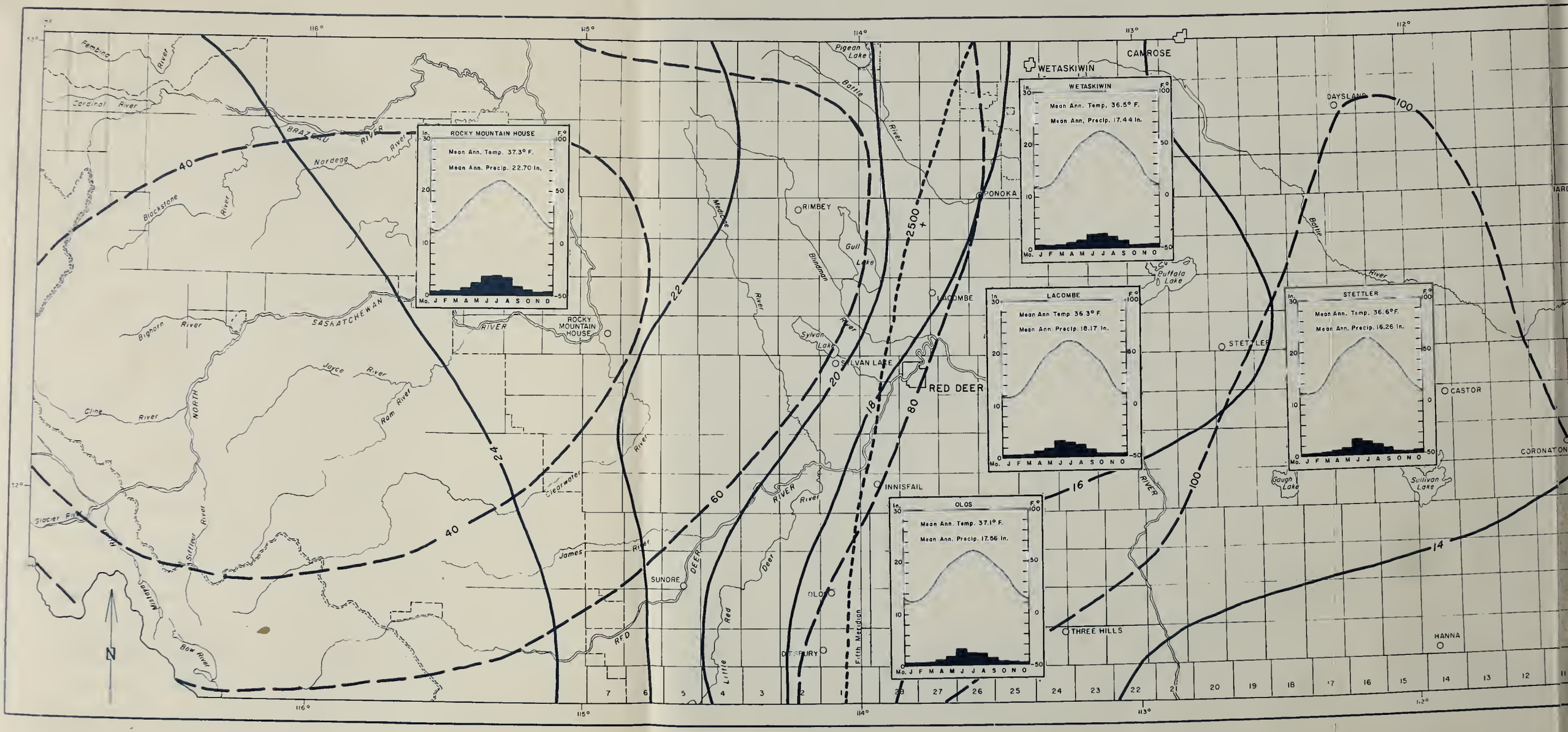
[20] In order to give the climatic context of the region, much of the following discussion refers to all of Central Alberta.

[21] See publications of the Research Council of Alberta; also Grace L. Powell, The Relationship of Physiography to the Hail Distribution Pattern in Central and Southern Alberta, unpublished M.Sc. thesis, University of Alberta, Edmonton, 1961.


ROCKY MOUNTAIN HOUSE
Mean Ann. Temp. 37.3° F.
Mean Ann. Precip. 22.70 In.
WETASKIWIN
Mean Ann. Temp. 36.5° F.
Mean Ann. Precip. 17.44 In.
LACOMBE
Mean Ann Temp. 36.3° F.
Mean Ann Precip. 18.17 In.
STETTLER
Mean Ann. Temp. 36.6° F.
Mean Ann. Precip. 16.26 In.
OLOS
Mean Ann. Temp. 37.1° F.
Mean Ann. Precip. 17.56 In.
Mo. J F M A M J J A S O N D
In.
F.°
WETASKIWIN
CAMROSE
DAYSLAND
PONOKA
RIMBEY
LACOMBE
STETTLER
SYLVAN LAKE
RED DEER
CASTOR
INNISFAIL
SUNORE
OLOS
THREE HILLS
HANNA
ROCKY MOUNTAIN HOUSE
DIDSBURY
CORONATION
Pembina River
Cardinal River
Brazeau River
Nordegg River
Blackstone River
Bighorn River
SASKATCHEWAN RIVER
Joyce River
Cline River
North Ram River
Clearwater River
Glacier Fire
Stiffler River
Mistaya River
Bow River
James River
Deer River
Red Deer River
Little Red Deer River
Meadow Creek
Pigeon Lake
Battle River
Gull Lake
Buffalo Lake
Sylvan Lake
Gaugh Lake
Sullivan Lake
Fifth Meridian
RFD
40
22
24
60
20
18
80
2500+
100
16
14
N
116°
115°
114°
113°
112°
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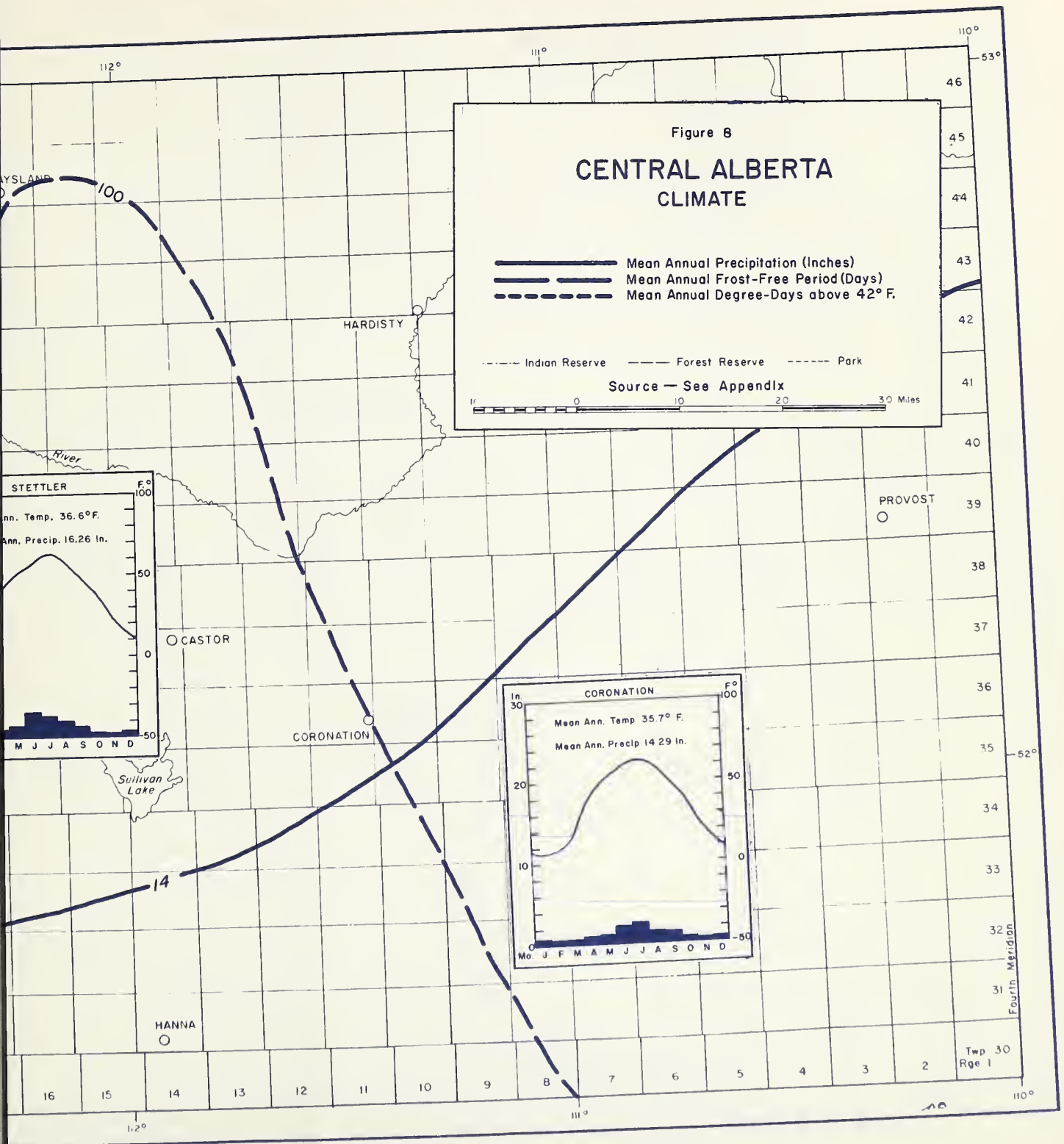
Figure 8
CENTRAL ALBERTA
CLIMATE
Mean Annual Precipitation (Inches)
Mean Annual Frost-Free Period (Days)
Mean Annual Degree-Days above 42° F.
Indian Reserve
Forest Reserve
Park
Source — See Appendix
0 10 20 30 Miles
HARDISTY
PROVOST
CASTOR
CORONATION
HANNA
Sullivan Lake
River
100
14
STETTLER
Ann. Temp. 36.6°F.
Ann. Precip. 16.26 in.
M J J A S O N D
CORONATION
Mean Ann. Temp 35.7° F.
Mean Ann. Precip 14.29 in.
Mo. J F M A M J J A S O N D
112°
111°
110°
53°
52°
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
Fourth Meridian
Twp 30
Rge 1

light, and most of it falls as snow. Variability of precipitation is at least as significant as annual and monthly means. Variability, expressed in proportional terms, generally increases as precipitation decreases, and is particularly significant because mean precipitation is no more than adequate for agricultural crops. It is not unusual to have a "dry year" when precipitation is well below normal, or even a cycle of dry years, as in the nineteen-thirties, when crops fail for lack of water. This is especially so in eastern Central Alberta where mean precipitation is marginal for crop-growth. On the other hand the west receives sufficient precipitation to support dense forest growth.

The annual pattern of temperatures is markedly continental. Summer maxima occasionally reach the vicinity of 100°F. and winter minima drop to -50° in some years. This pattern of warm summers and cold winters varies only a little within the Red Deer region, with a slight tendency toward greater extremes in the east. Here the growing season is somewhat longer and warmer; that is there are more degree-days above 42° F. The daily pattern of temperatures is also one of extremes. Even in months when maxima reach the eighties or nineties, minima may be in the thirties. As a result, the hazard of frost limits the varieties of crops that may be grown. Variations from the mean annual frost-free period are great, and the records of most stations show at least one year when frost has occurred even in the warm-

est month.[22]

Table 1 shows specific data on climate within the Red Deer region, including monthly and annual means of temperature and precipitation; and of potential evapo-transpiration calculated according to Thornthwaite's methods and tables.[23] The six stations for which data are shown are representative of the broad similarities and differences within the region, and stations are omitted which show distinct anomalies because of short records or peculiarities of site. All of the stations except Rocky Mountain House show annual water deficiencies, increasing from west to east. Virtually all monthly water surpluses occur in months when mean temperatures are below freezing, and therefore much storage is initially in the form of snow or ice. Moisture storage capacities vary considerably from one place to another with the differences in soils in this glaciated region. There is also variation from year to year in the amount of melt-water that is absorbed in the spring. As a generalization it can be said that in most years spring thawing is sufficiently slow for a significant part of the melt-water to go into soil storage. Some farmers find it profitable to ridge the snow in their

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[22]C. C. Boughner, R. W. Longley, and M. K. Thomas, Climatic Summaries for Selected Meteorological Stations in Canada, Vol. III, "Frost Data," Canada, Department of Transport, Meteorological Division, Toronto, 1956.

[23]C. W. Thornthwaite and J. R. Mather, Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance, Drexel Institute of Technology, Laboratory of Climatology, Publications in Climatology, Vol. X, No. 3, Centerton, New Jersey, 1957.

TABLE 1

CLIMATIC DATA FOR SIX STATIONS IN CENTRAL ALBERTA

| Monthly Mean | | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Annual Mean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Coronation** | | | | | | | | | | | | | | |
| Temp. | (F.°) | 6.2 | 7.4 | 20.4 | 37.7 | 50.5 | 57.6 | 63.1 | 60.4 | 50.7 | 39.9 | 22.5 | 12.0 | 35.7 |
| P.Et. | (In.) | 0 | 0 | 0 | 0.69 | 2.79 | 4.08 | 4.93 | 4.13 | 2.23 | 1.10 | 0 | 0 | 19.95 |
| Precip. | (In.) | 0.89 | 0.70 | 0.83 | 1.03 | 1.19 | 2.15 | 2.60 | 1.50 | 1.38 | 0.86 | 0.51 | 0.65 | 14.29 |
| P.-P.Et. | (In.) | 0.89 | 0.70 | 0.83 | 0.34 | -1.60 | -1.93 | -2.33 | -2.63 | -0.85 | -0.24 | 0.51 | 0.65 | -5.66 |
| **Lacombe** | | | | | | | | | | | | | | |
| Temp. | (F.°) | 8.3 | 11.6 | 23.1 | 38.7 | 50.2 | 56.6 | 62.0 | 59.0 | 50.3 | 40.3 | 24.1 | 11.6 | 36.3 |
| P.Et. | (In.) | 0 | 0 | 0 | 1.04 | 2.79 | 4.08 | 4.93 | 4.13 | 2.23 | 1.10 | 0 | 0 | 20.30 |
| Precip. | (In.) | 0.66 | 0.72 | 0.86 | 1.33 | 1.94 | 3.19 | 2.96 | 2.53 | 1.61 | 0.86 | 0.78 | 0.73 | 18.17 |
| P.-P.Et. | (In.) | 0.66 | 0.72 | 0.86 | 0.27 | -0.85 | -0.89 | -1.97 | -1.60 | -0.62 | -0.24 | 0.78 | 0.73 | -2.13 |
| **Olds** | | | | | | | | | | | | | | |
| Temp. | (F.°) | 12.9 | 14.7 | 24.1 | 38.4 | 48.6 | 55.1 | 60.7 | 58.1 | 49.9 | 40.5 | 26.0 | 16.6 | 37.1 |
| P.Et. | (In.) | 0 | 0 | 0 | 1.04 | 2.79 | 3.67 | 4.52 | 3.75 | 2.23 | 1.10 | 0 | 0 | 19.10 |
| Precip. | (In.) | 0.61 | 0.71 | 0.93 | 1.22 | 1.95 | 3.31 | 2.61 | 2.41 | 1.60 | 0.95 | 0.73 | 0.53 | 17.56 |
| P.-P.Et. | (In.) | 0.61 | 0.71 | 0.93 | 0.18 | -0.84 | -0.36 | -1.91 | -1.34 | -0.63 | -0.15 | 0.73 | 0.53 | -1.54 |
| **Rocky Mountain House** | | | | | | | | | | | | | | |
| Temp. | (F.°) | 12.9 | 16.5 | 26.4 | 38.7 | 48.5 | 54.5 | 59.7 | 57.0 | 49.0 | 40.9 | 26.9 | 16.0 | 37.3 |
| P.Et. | (In.) | 0 | 0 | 0 | 1.04 | 2.79 | 3.67 | 4.52 | 3.75 | 2.23 | 1.10 | 0 | 0 | 19.10 |
| Precip. | (In.) | 0.88 | 1.00 | 0.95 | 1.48 | 2.46 | 3.82 | 3.89 | 3.52 | 1.95 | 1.04 | 0.79 | 0.92 | 22.70 |
| P.-P.Et. | (In.) | 0.88 | 1.00 | 0.95 | 0.44 | -0.33 | 0.15 | -0.63 | -0.23 | -0.28 | -0.06 | 0.79 | 0.92 | 3.60 |
| **Stettler** | | | | | | | | | | | | | | |
| Temp. | (F.°) | 10.2 | 12.0 | 23.0 | 38.4 | 50.0 | 56.7 | 62.6 | 59.1 | 49.4 | 39.9 | 24.2 | 13.7 | 36.6 |
| P.Et. | (In.) | 0 | 0 | 0 | 1.04 | 2.79 | 4.08 | 4.93 | 4.13 | 2.23 | 1.10 | 0 | 0 | 20.30 |
| Precip. | (In.) | 0.57 | 0.64 | 0.89 | 1.10 | 1.64 | 3.14 | 2.80 | 2.04 | 1.32 | 0.71 | 0.61 | 0.80 | 16.26 |
| P.-P.Et. | (In.) | 0.57 | 0.64 | 0.89 | 0.06 | -1.15 | -0.94 | -2.13 | -2.09 | -0.91 | -0.39 | 0.61 | 0.80 | -4.04 |
| **Wetaskiwin** | | | | | | | | | | | | | | |
| Temp. | (F.°) | 8.7 | 11.4 | 23.1 | 38.6 | 50.7 | 57.0 | 62.1 | 58.8 | 50.3 | 40.5 | 24.4 | 12.6 | 36.5 |
| P.Et. | (In.) | 0 | 0 | 0 | 1.04 | 2.79 | 4.08 | 4.93 | 4.13 | 2.23 | 1.10 | 0 | 0 | 20.30 |
| Precip. | (In.) | 0.91 | 0.78 | 0.87 | 1.26 | 1.72 | 2.88 | 2.93 | 2.23 | 1.49 | 0.73 | 0.77 | 0.87 | 17.44 |
| P.-P.Et. | (In.) | 0.91 | 0.78 | 0.87 | 0.22 | -1.07 | -1.20 | -2.00 | -1.90 | -0.74 | -0.37 | 0.77 | 0.87 | -2.86 |

Sources: Temperature and precipitation from Canada, Department of Transport, Meteorological Branch, Temperature and Precipitation Normals for Canadian Weather Stations Based on the Period 1921-1950, Cir.-3208 Cli.-19, June 3, 1959. Potential evapotranspiration derived from tables in C. W. Thornthwaite and J. R. Mather, Instructions and Tables for Computing Potential Evapotranspiration and the Water Balance, Drexol Institute of Technology, Laboratory of Climatology, Publications in Climatology, Vol. X, No. 3, Centerton, New Jersey, 1957.

fields in order to hold blowing snow in a more even distribution and so build up a more effective moisture surplus in the spring. Spring melt-water is undoubtedly of great value in partially overcoming water deficiencies during the growing season, but for much of the region there is still an annual deficiency.

A comparison of the climate of the region with other North American climates may be made by means of Thornthwaite's classification of climate.[24] Lacombe and Olds represent the climate of the core area of the region, with the classification $C_2C'_2sb'$, that is their climate is moist subhumid, microthermal group 2, with a moderate summer water deficiency, and near normal thermal efficiency. Stettler and Coronation in the eastern part of the region have the classification $C_1C'_2sb'_1$. Their climate is thus dry subhumid, microthermal group 2 with a moderate (for a dry climate) winter water surplus, and near normal thermal efficiency. The climate at Rocky Mountain House in the western part of the region has the classification $B_1C'_2rb'_1$. It is humid, microthermal group 2, with little or no water deficiency, and near normal thermal efficiency. The climate at Wetaskiwin, on the northern edge of the region, differs from that at Lacombe and Olds only in having a slightly greater summer water deficiency. Its classification is $C_2C'_2s_2b'_1$. Thus it is moist subhumid,

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[24] C. W. Thornthwaite, "An Approach Toward a Rational Classification of Climate," Geogr. Rev., Vol. XXXVIII, No. 1, Jan. 1948, pp. 55-94.

microthermal group 2, with a large summer water deficiency, and near normal thermal efficiency.

The effects of relief on the climate of the region are primarily those of the Rocky Mountains to the west, to which reference has already been made. The mountains also make possible chinook winds in the western part of the region. Thus the cold winters are commonly moderated by brief periods when temperatures reach the forties or fifties. The effect is significant both for human occupance and for animal life. The relief of the plains, as Kendrew and Currie suggest, has little effect on the macro-climate.

> The most general feature of the relief, the long and gradual slope eastward from the foothills of the Rockies to the lowland axis of the continent from the lower Mackenzie Valley in the northwest to Lake Winnipeg in the southeast is of less significance than might be expected, chiefly because the slope is very gentle, but also because its effects are masked by the much larger influence of continentality. . . . The distant effect of the western mountain-system, which forms a fairly effective climatic barrier between Central Canada and the windward ocean, the Pacific, is perhaps more potent than the slope of the area itself.[25]

Microclimatic variations resulting from relief are numerous. Perhaps the most important of them is the variation in ground temperature at different sites resulting from cold air drainage to low areas during periods of temperature inversion in the lower atmosphere. This effect causes great variation in the distribution of frost during the warmer months, and significantly lower winter temperatures in low-lying sites such as that of the central part of the city of Red Deer, situated in

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[25]W. G. Kendrew and B. W. Currie, The Climate of Central Canada, Queen's Printer, Ottawa, 1955, pp. 6-7.

the valley of the Red Deer River. Variations in aspect and slope also cause significant microclimatic differences in temperature and precipitation.

In general, the central part of the region has the most favorable climate for agriculture. To the east there is a greater water deficiency, and to the west the growing season is shorter. This climatic distribution, together with the related pattern of soils, has led to the development of more intensive and more productive forms of agriculture in the central part of the region than elsewhere.

4. Natural Vegetation

The term natural vegetation is used here to mean present vegetation that is virtually unchanged as a result of human occupance of the region. Two major difficulties are involved in the use of such a definition.[26] The first is that even when a climax vegetation is said to have been attained, the composition and distribution of natural vegetation are always changing in some degree because of constant changes in climate and ecological balance. It is therefore necessary to

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[26]There is also a semantic difficulty in that defining natural vegetation as being unchanged by man implies that man is not natural. This difficulty appears to arise from the common dichotomous division of geography into a natural or physical part and a human part. In the interest of the essential unity of regional geography this dichotomy must be avoided wherever possible, but the terms natural and physical are difficult to avoid without awkwardness.

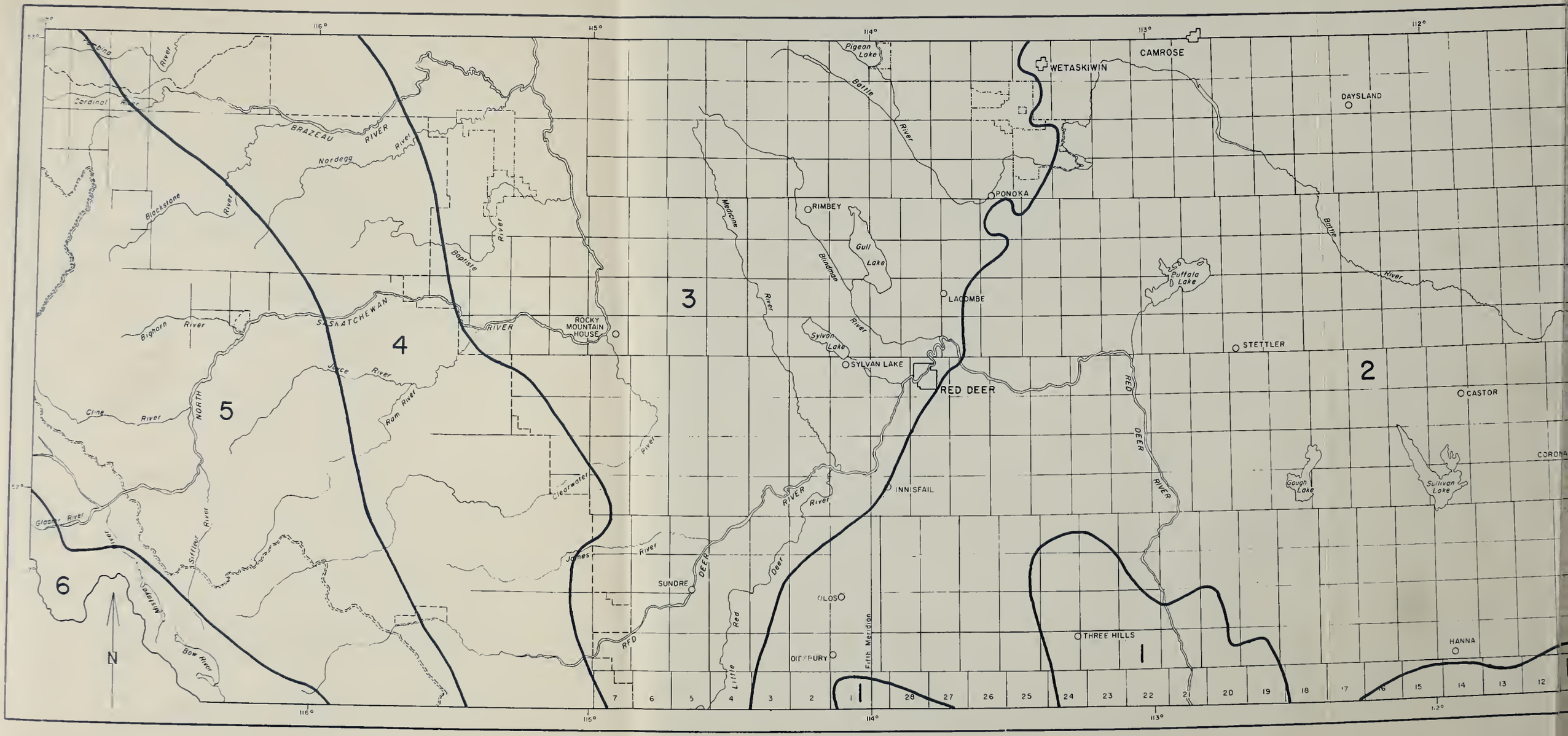
consider how significant the changes are. Since there seem to be too many difficulties either in reconstructing a past natural vegetation or in projecting a future climax vegetation, present vegetative cover is here considered to be natural vegetation. The other major difficulty is the significance of human occupance in the alteration of vegetative cover. There are no adquate records which would indicate the length of human occupance before agricultural settlement nor the kind of changes this occupance produced in the vegetative cover. Partial records exist for the period since agricultural settlement, but even these are too scanty to permit correct interpretation without extremely detailed study. Thus previous modifications by man are not considered here except in a few instances where reasonably reliable evidence and interpretations exist.

Within the limitations outlined above there are still difficulties in mapping and interpreting the natural vegetation of the Red Deer region. This area lies in a zone of transition between the vegetation of the interior plains of the continent, that of the boreal zone to the north, and that of the mountain zone to the west. Thus there is considerable mixing of plant species and plant communities which are not found together elsewhere. In some places this has resulted in the development of hybrid varieties of certain species. The intermingling of the vegetation of these three different zones has also made it extremely difficult to draw boundaries for different vegetational regions. Two botanists who agree

on the nature and distribution of the vegetation may draw completely different maps of it because their interpretations and categories differ.

The only major vegetational boundaries which are significant in the Red Deer region are those of the aspen parkland (see Figure 9). The other major boundaries in Central Alberta are included in order to show the context of the region's vegetation. The broad patterns of the different zones are primarily a reflection of climatic differences, though the effects of fire and of human occupance are also significant. The general pattern of natural vegetation in the region is one of transition from grassland in the southeast through parkland in the center and mixed forest in the west to coniferous forest in the southwest. This pattern corresponds closely with an increase in mean annual precipitation from less than fourteen inches to more than twenty-four inches. There is also a rough correspondence with decreasing length of growing season and potential evapo-transpiration. With increasing altitude in the mountains to the southwest of the region there is a further transition to alpine vegetation.

The vegetation zone mapped as grassland on the southeastern margin of Central Alberta has been variously described as steppe, prairie, mixed prairie, and short-grass prairie. It is characteristic of the brown soil zone which extends to the southeast of Central Alberta (see Figure 7). Representative species of the grasses found here are spear grass (Stipa comata), porcupine grass (Stipa spartea curtiseta), and blue


116°
115°
114°
113°
112°
52°
Pigeon Lake
Battle River
WETASKIWIN
CAMROSE
DAYSLAND
PONOKA
RIMBEY
Medicine River
Gull Lake
Blindman River
LACOMBE
Buffalo Lake
Battle River
STETTLER
Sylvan Lake
SYLVAN LAKE
RED DEER
CASTOR
CORONA
Gough Lake
Sullivan Lake
INNISFAIL
RED DEER RIVER
Red Deer River
Fifth Meridian
OLDS
DIDSBURY
THREE HILLS
HANNA
SUNDRE
ROCKY MOUNTAIN HOUSE
BRAZEAU RIVER
Nordegg River
Blackstone River
Bighorn River
SASKATCHEWAN RIVER
Baptiste River
Job's River
Ram River
Clearwater River
James River
RFD
Little Red Deer River
Cline River
NORTH RAM River
Clearwater River
Glaster River
Saffron River
Nistikos Creek
Bow River
3
4
5
6
2
1
7 6 5 4 3 2 1 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12
N

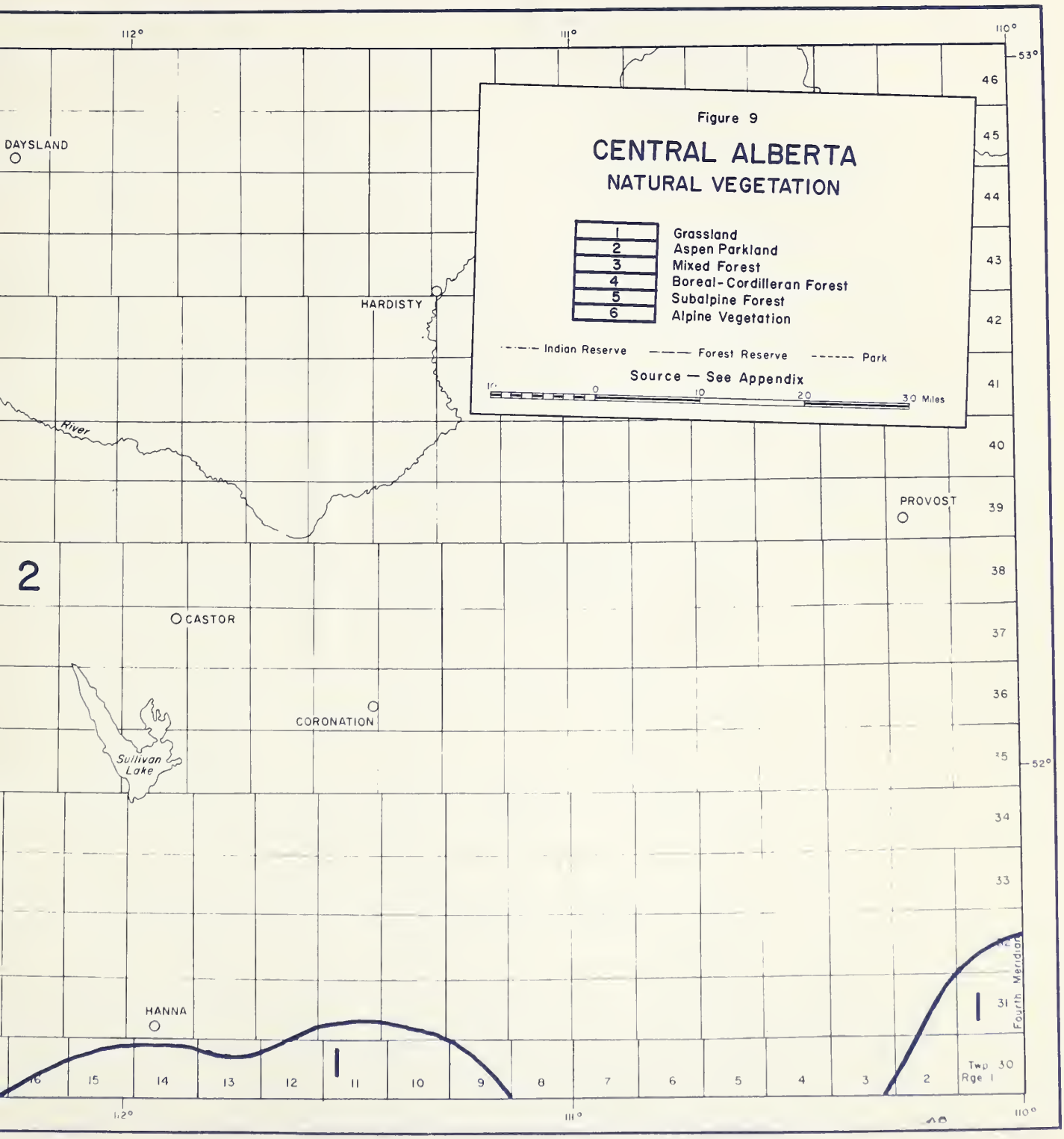


Figure 9
CENTRAL ALBERTA
NATURAL VEGETATION
1 Grassland
2 Aspen Parkland
3 Mixed Forest
4 Boreal-Cordilleran Forest
5 Subalpine Forest
6 Alpine Vegetation
Indian Reserve
Forest Reserve
Park
Source — See Appendix
0 10 20 30 Miles
112°
111°
110°
53°
52°
DAYSLAND
HARDISTY
River
PROVOST
CASTOR
CORONATION
Sullivan Lake
HANNA
2
Fourth Meridian
Twp 30
Rge 1

grama grass (Bouteloua gracilis).[27] The first two of these are perennial bunch grasses with blades about a foot long and stems growing as much as three feet high.[28] Blue grama grass, often called buffalo grass, is a densely tufted low perennial, usually less than a foot high. It is an excellent forage grass, considerably superior in this respect to the other two species. Among the many other species of this area several species of cactus are found. Before agricultural settlement of the grassland became general, overgrazing by plains buffalo (Bison bison) and fires set by man undoubtedly had significant effects on the composition of the vegetation.[29] It is probable that overgrazing, both by buffalo and later by domestic animals, has tended to suppress the more palatable grasses in favor of spear grass and similar species. Also the solonetzic soils found in some parts of the area tend to favor the growth of less palatable grasses.

The aspen parkland of Central Alberta[30] has long been

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[27]E. H. Moss, "The Vegetation of Alberta," The Botanical Review, Vol. XXI, No. 9, Nov. 1955, p. 508.

[28]Detailed botanical descriptions and classifications of these and the other species mentioned are available in E. H. Moss, Flora of Alberta, Toronto and Oxford, 1959.

[29]Ralph D. Bird, Ecology of the Aspen Parkland of Western Canada in Relation to Land Use, Canada Department of Agriculture, Research Branch, Publication 1066, Ottawa, February 1961, pp. 27-29.

[30]The boundaries of the aspen parkland shown on Figure 9 are those established from extensive field observation by Charles Bird (the son of Ralph D. Bird) who is doing research on the mosses of the aspen parkland as a post-doctoral fellow at the University of Alberta. The results of his research in this area have not yet been published, but he has kindly given permission for their use here.

an area of particular interest, both botanically and agriculturally. One of the first settlers to establish a farm in the Red Deer region, the Rev. Leonard Gaetz, reported in 1890 before a parliamentary committee on agriculture that the parkland is

> a country pre-eminently suited to mixed farming. It has some peculiar features in this respect, that it is well-wooded, and a well-watered country. It is true that there is not wood everywhere where a farmer would wish to find it, but it is true that it answers the description of a park-like country, with sufficient timber for necessary purposes in the greater portion.[31]

The peculiar feature of the vegetation of the area is the intermixture of groves of trees with open grasslands. The proportion of land covered by trees increases fairly evenly from the grassland on the southeast to the forest on the west. Though there is general agreement on the nature of the vegetative pattern, there is frequent disagreement on its interpretation and on where boundaries should be drawn. One of the problems of interpretation is whether the wooded areas of the parkland are remnants of an earlier forest or forerunners of an advancing forest. The latter view has won fairly general though not complete support. Ralph D. Bird emphasizes the importance of fires set by Indians in keeping forest growth at a minimum.[32] There is also evidence that since agricultural settlement trees have grown on former grasslands, partially as a result of the firebreaks provided by cultivated

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[31]Rev. Leonard Gaetz, Report of Six Years Experience of a Farmer in the Red Deer District, Queen's Printer, Ottawa, 1892, pp. 8-9.

[32]Ralph D. Bird, loc. cit.

land and roads, and partially because of other factors, such as better moisture supply from the accumulation of snow drifts.

> The Hospital Hill, now well covered with a grove of poplars, was open land in the early days of Red Deer . Another example was given by a farmer near Pine Lake who said that forty years ago his father cut hay from a part of the farm now overgrown with trees and underbrush. On the north slope of Michener Hill fire-blackened stumps are testimony of ancient fires, although this part of the district has not been burned over within the memory of the oldest settler.[33]

Further evidence for the advance of the forest is provided by the areas of dark grey (degraded black) soils found within the parkland. These soils, now generally wooded where not cultivated, are thought to have developed under grassland before being degraded under forest cover.[34]

The tree from which the aspen parkland takes its name is the aspen poplar (Populus tremuloides), also commonly known as trembling aspen, aspen, or poplar. It is a slender tree which may reach a height of 100 feet under exceptionally favorable conditions, but is generally 40 to 60 feet high at maturity in Central Alberta. Young trees have smooth, light greyish-green bark which becomes darker and furrowed on older trees. The aspen is by far the most abundant tree in the parkland. Other trees which have local importance include: balsam poplar (Populus balsamifera), which often occupies poorly drained sites; many species of willow (Salix); and white spruce (Picea glauca), which occurs characteristi-

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[33]Robert W. Dawe, The Development of the Red Deer Community in Relation to the Development of Western Canada, unpublished M.A. thesis, University of Alberta, Edmonton, 1954, p. 5.

[34]E. H. Moss, pers. comm., Edmonton, March 31, 1962.

cally on north-facing slopes, along permanent watercourses, and where soil texture is coarse. Some representative shrubs of the area are: saskatoon (Amelanchier alnifolia), which bears edible berries; prickly rose (Rosa acicularis), the floral emblem of Alberta; common wild rose (Rosa woodsii); and beaked hazelnut (Corylus cornuta), which bears edible nuts. Among the many grasses found in the parkland one species is considered by Moss to be dominant throughout much of the area, and to be the chief source of the organic content of the black soils.[35] This species is rough fescue (Festuca scabrella). Characteristically it grows in dense tufts from one to three feet high, and is quite palatable to wild and domestic herbivores.

The large transitional zone called mixed forest on Figure 9 has most of the species of the parkland on its eastern margin where poplars tend to be the dominant species. Toward the west the proportion of white spruce increases until this species becomes dominant. It may grow to 120 feet on favorable sites and provides substantial amounts of merchantible timber in some of the westernmost areas. In very poorly drained sites, such as muskegs, the black spruce (Picea mariana) is common. It is much smaller than the white spruce, reaching only about thirty feet. The tamarack (Larix laricina) is found in similar sites, but is not so widespread as the black spruce. The jack pine (Pinus banksiana), growing from

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[35] E. H. Moss, "The Vegetation of Alberta," op. cit., p. 521.

fifteen to thirty-five feet high, is common on sandy and gravelly sites throughout the mixed forest zone. The lodgepole pine (Pinus contorta var. latifolia) is an extremely straight tree which grows in dense stands up to about 100 feet high in the western part of the mixed forest zone. Within the mixed forest zone several characteristic types of bog occur. Some of these are associated with black spruce, and in others tree cover is sparse. Two of the common components of these bogs are feather moss (Hylocomium spendens) and various species of sphagnum (Sphagnum).

The line between the mixed forest and the boreal-cordilleran zone marks the approximate western limit of deciduous trees. The conifers of the boreal-cordilleran zone are in general the same species as are found in the mixed forest zone. The lodgepole pine becomes more common, but white spruce is probably the leading species. One of the other species found here is the alpine fir (Abies lasiocarpa), which also extends for some distance into the mixed forest zone.

The subalpine forest has most of the species of trees found in the boreal-cordilleran zone, but with the partial replacement of white spruce by engelmann spruce (Picea engelmanii). (In some areas of southern Alberta there are stands of engelmann spruce considerably taller than the white spruce and comprising some of the best timber stands in Alberta, but in Central Alberta the two species are of about the same size.) If one tree may be said to predominate in the subalpine zone, it is the lodgepole pine. This is probably the result of

forest fires, which have burnt most of the forested areas at one time or another in the recent past and which favor the seeding of pines because the heat opens the cones, releasing the seed.

The zone of alpine vegetation shown on Figure 9 is a generalization for the area lying between the timber line and the snow line. Above the timber line are sub-zones of trees smaller than forest size, then of scrub, then of various kinds of ground-hugging alpine vegetation. The only significance of this zone to the Red Deer region is as a part of the recreational areas of the mountain parks.

The natural vegetational cover of the Red Deer region has more economic significance for agriculture than for forestry. The predominant grasses of the parkland and most of the grassland are generally highly palatable and nutritious for livestock, and the proportions of shrubs and herbaceous plants are not excessive under natural conditions. The region has no commercial timber which could support large-scale lumbering or pulpwood operations. The stands which do exist are of local significance only, providing limited supplies of fuel, posts, and poles in the parkland, and some rough lumber in the forested area to the west.

5. Soils

The soils of the region include a great variety of types because of variations in climate, conditions of site

and drainage, parent material, and vegetative cover.[36] The zonal soils of the region fall within two orders, the chernozemic soils, occurring in the eastern and central parts of the region, and the podzolic soils, occurring in the western part of the region (see Figure 7). In addition the region has areas of intrazonal soils falling within the solonetzic and gleysolic orders, and azonal soils falling within the regosolic and organic orders. The general pattern of distribution of the soils of the region is mapped and discussed according to the zonal soils. In addition the distribution of various parent materials is used as an aid to understanding the soils of the region.

Soils of the chernozemic order within the region include all four of the great groups. The brown group occurs only in a small area southeast of Coronation where mean annual precipitation is less than 14 inches, and where natural vegetative cover consists almost entirely of short grasses. The modal profile has a brown A horizon about 5 inches deep, a layer of lime accumulation about 15 inches below the surface, prismatic to columnar structure, and moderately fine

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[36]The broad soil classifications used here are those adopted by the National Soil Survey Committee of Canada in 1960. See "Report of the Meeting of the National Soil Survey Committee of Canada," February 22 to 27, 1960, Ontario Agricultural College, Guelph. The following information about the soils of the region is based on the reports and maps of the Alberta Soil Survey (see bibliography). The terms zonal, intrazonal, and azonal are employed here for convenience because of their widespread use in the earlier literature and maps of the area, though it is recognized that they lack precise definition.

texture. In a high proportion of the brown soil zone surface deposits, consisting of till and lacustrine materials, have been sorted by wind and water, leaving a parent material composed largely of sands and silts. Hence there is a considerable proportion of regosolic soils, having virtually no profile development, loose structure, and coarse texture. In the flatter areas where water tends to accumulate, solonetzic soils of the alkali solonetzic group have developed, partly because of the saline nature of some of the bedrock from which the till is largely derived. The leached A horizon varies in depth from 3 inches to 3 feet, and is underlain by a hard, columnar B horizon. The pH of the A horizon is usually over 7 and that of the C horizon over 8.[37]

The dark brown group of soils occurs in a zone generally north and east of Gough Lake and Sullivan Lake. Mean annual precipitation is about 15 inches and natural vegetation is a mixture consisting largely of mixed short and long grasses with some isolated patches of deciduous trees. The modal profile has a dark brown A horizon about 7 inches deep, a layer of lime accumulation 20 to 24 inches below the surface, prismatic structure, and moderately fine texture. The area around Gough Lake and Sullivan Lake has some soils of the solonetzic group, partly because of the salinity of the thin till and underlying bedrock and partly because of the absence of surface drainage. A typical example is a solodized solonetz,

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[37] F. A. Wyatt et al., Soil Survey of Sullivan Lake Sheet, University of Alberta, Bulletin No. 31, Edmonton, August, 1938.

with an A horizon about 8 inches deep, a columnar B horizon, a layer of calcium and sulfate accumulation from 18 to 24 inches deep, and a pH varying from 6.3 at the surface to 7.4 in the C horizon.[38]

The next group of zonal soils, in the area northeast and southwest of Stettler, consists of thin black soils, a special division of the chernozemic order, transitional between the dark brown and black groups. Mean annual precipitation is about 16 inches and natural vegetation is parkland. The modal profile has an A horizon about 10 inches deep, the upper half being black and the lower half dark brown. The lime layer is about 30 inches deep, structure is prismatic, and texture is loamy. Northeast of Stettler is an area of solodized solonetz developed on thin lacustrine deposits overlying till from the Edmonton formation. The A horizon contains about 5 inches of black silt loam of weakly prismatic structure, about 2 inches of dark brown silt loam, and about 2 inches of grey-brown very fine sandy loam. The structure of the B horizon is columnar to blocky; there is a layer of sulfate accumulation about 27 inches from the surface; and the pH varies from 6.0 at the surface to 7.9 in the C horizon.[39]

The largest group of zonal soils within the region is the black soils of the chernozemic order, found in the central

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[38] Ibid. and W. E. Bowser, T. W. Peters, and J. D. Newton, Soil Survey of Red Deer Sheet, University of Alberta Bulletin No. 51, Edmonton, 1951.

[39] Ibid.

area of the region extending northeast and southwest of Red Deer. These are the most fertile soils of the region. Mean annual precipitation varies from less than 17 inches in the east to more than 20 inches in the west. Natural vegetation is transitional, from parkland in the east to mixed forest in the west. The bedrock underlying most of the area is the Paskapoo formation of Tertiary age, consisting mostly of freshwater deposits of generally coarser texture than the Upper Cretaceous formations to the east. The upland areas are generally covered by ground moraine and hummocky moraine, and the lowland areas by ground moraine and lacustrine deposits. The modal profile of a black soil in the area has an A horizon about 12 inches deep, a lime layer about 30 inches from the surface, granular structure, and loamy texture. Major variations include soils developed on sandy and silty parent materials, which have a shallower A horizon and looser texture; and soils developed on finer silts and clays, which have a deeper A horizon, prismatic structure, and heavier texture. Some of these latter are solonetzic.[40]

Within the area of black soils and along the northern part of its eastern margin are smaller areas where the soils are of the dark grey (degraded black) group. In general these

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[40] Ibid.; F. A. Wyatt et al., Soil Survey of Rosebud and Banff Sheets, University of Alberta Bulletin No. 40, Edmonton, July, 1943; W. E. Bowser et al., Soil Survey of Peace Hills Sheet, University of Alberta Bulletin No. 48, Edmonton, Sept. 1947; and T. W. Peters and W. E. Bowser, Soil Survey of Rocky Mountain House Sheet, University of Alberta Bulletin No. SS-1, Edmonton, Jan., 1960.

are areas of higher land. The natural vegetation is predominantly mixed forest rather than parkland. These soils are transitional between the black and grey wooded groups, and the profiles show some characteristics of each. It seems likely that these soils originally developed under grass, but have been under tree cover long enough for the effects of acid leaching to be noticeable. In this respect they resemble the podzolic, grey wooded soils.

The westernmost part of the region is the only area having zonal soils outside the chernozemic order. Here the soils are of the grey wooded group of the podzolic order. Mean annual precipitation increases westward through the area from about 20 inches to 23 inches. Natural vegetation is composed of heavy, mixed deciduous and coniferous forest, and moss and sedge bogs in many low-lying areas. The modal profile has a leaf mat 2 to 3 inches thick, a very thin or nearly absent $A_h$ horizon, a pale $A_e$ horizon of platy structure reaching a depth of 6 to 8 inches, a blocky structured B horizon, and a lime layer about 50 inches below the surface. These soils are of relatively low fertility because of the leaching of soluble minerals from the upper horizons, though some have been improved by cropping practices such as the use of legumes. Variations within the zone of grey wooded soils include dark grey wooded soils, which have been less strongly leached; and podzol grey wooded soils, which have been more strongly leached and which have a pinkish-brown layer in the

A horizon and a reddish-brown layer in the B horizon.[41]

Local variations in the western area of the region include gleysolic soils (for example, in Twp. 39, Rge. 5 and 6, W. 5 M.) developed on poorly drained lacustrine materials such as silty clay loam where the water table is high. The upper A horizon is usually dark and muck-like, the B horizon of granular texture, and the parent material varved, with a high lime content. Another important variation is the occurrence to the east and southeast of Rocky Mountain House of organic soils. These have surface layers more than 12 inches thick composed of sedge and moss peats developed on poorly drained sites. They are generally unsuitable for cultivation.

This description of the soils of the region, because of the scale employed, necessarily omits many local variations of limited extent, such as soils developed on recent alluvium in river valleys, regosolic soils on gravels and sand dunes, colluvial materials on steep-sided river valleys, and bedrock exposures. Of the broader patterns which emerge within the region probably the most important is that of the fertility of the soils. In general the most fertile soils occur in the central part of the region. To the east fertility decreases because of higher salinity and because of lower organic content and its consequence of wind erosion. To the west fertility decreases because of the leaching of soluble minerals and because of the development of organic soils un-

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[41] Ibid.

suitable for agriculture. The black soils of the chernozemic order in the area centered upon Red Deer are, on the whole, excellent by world standards. They form the basis for prosperous and stable agricultural development, and are the region's most important economic resource.

# CHAPTER III

## SETTLEMENT AND POPULATION

### 1. Pre-Agricultural Occupance

Early records indicate that in the middle of the eighteenth century when fur traders first penetrated the basin of the Red Deer River it was occupied by two groups of Indian tribes.[1] One group was typified by the Plain Crees, so called to distinguish them from the Wood Crees who occupied the forest lands to the north. The Plain Crees had moved southward into the grassland where they adapted to a way of life characterized by buffalo hunting. To the southwest of the Crees, along the margin of the western forest, were the three Blackfoot tribes--the Blackfoot proper, the Blood, and the Peigan--who also depended primarily upon buffalo hunting. In addition to the Cree and Blackfoot tribes, a separate tribe, the Stonys, occupied territory along the margin of the Alberta foothills, including the area west and southwest of Rocky Mountain House. The Indians hunted many animals besides buffalo, including the numerous red deer[2], whence came the

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[1] Arthur S. Morton, A History of the Canadian West to 1870-71, London, no date, pp. 1-21.

[2] The red deer are frequently referred to as such by early explorers, including Henry. The species is Cervus canadensis, now commonly called elk or wapiti. It resembles the red deer of Europe (Cervus elaphus) for which Henry probably mistook it, rather than the Scandanavian "elk" (Alces machlis), which is more like our moose. See Alexander Henry and David Thompson, Manuscript Journals, edited by Elliot Coues, New York, 1897, p. 2.

names of the city of Red Deer, the Red Deer River, the Waskasoo (Cree for red deer) Creek, and the town of Ponoka (Blackfoot for red deer). By the eighteenth century the mode of life of both groups of Indians had been radically modified by two indirect acquisitions from European culture, the horse and the rifle.

In his account of this period Morton states:

> The first White Man to see the Blackfeet (the Bloods) in their own land was Anthonay Henday of the Hudson's Bay Company--the first European to set eyes on the northern Rockies (1754). He met the Archithinues, "The Enemy" as the Crees called them, west of the Red Deer River.[3]

Henday travelled a thousand miles from York Fort on Hudson's Bay to a Blood encampment somewhere west of the present site of Red Deer, leaving York Fort on June 26, 1754 and returning there on June 20, 1755.[4] His journey was one of the great feats in the history of the explorations of the fur traders. It was undertaken to extend the trade of the Hudson's Bay Company into territory where its monopoly was threatened by the Northwest Company. However, the Blackfoot tribes were unwilling to make the long journey to Hudson's Bay to trade there. Fur trading in their territory remained sporadic for another half century.

During the second half of the eighteenth century both the Hudson's Bay Company and the Northwest Company extended their networks of trading posts westward. In 1799 they es-

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[3]Morton, op. cit., p. 19.

[4]Ibid., pp. 245-49.

tablished Acton House and Rocky Mountain House respectively on opposite banks of the North Saskatchewan River near the present site of the town of Rocky Mountain House. Of the explorers and traders associated with Rocky Mountain House, David Thompson stands out, both for his monumental accomplishments as a geographer and surveyor, and because of the significance his name has in Central Alberta today.

Thompson came to Canada from Westminster in 1784 as an apprentice of the Hudson's Bay Company. As a result of disillusionment with the Company's policies, he left it in 1797 and joined the Northwest Company. He had been trained in mathematics at the Grey Coat School in Westminster and in surveying while employed by the Hudson's Bay Company. His first assignment with the Northwest Company was

> to determine the location of their posts, to locate the forty-ninth parallel of latitude, to go as far as the Missouri and visit the ancient villages of the agricultural nations that dwelt there, to inquire for the fossils of large animals, and to search for any monuments which might throw light on the ancient state of the countries travelled over and examined.[5]

From 1797 to 1800 Thompson explored the area between Lake Superior and the headwaters of the western tributaries of the Mississippi. He arrived at Rocky Mountain House in 1800 and explored and mapped much of the surrounding area, paying particular attention to the mountain passes to the west because of the Company's desire to develop trade routes to the

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[5]Gordon Charles Davidson, The North West Company, Berkeley, 1918, p. 92.

Pacific coast. Thompson crossed the Rockies to the headwaters of the Columbia River by way of the North Saskatchewan River, Howse Pass, and the Blaeberry River in 1807. His westward explorations culminated when he finally reached the mouth of the Columbia River in July 1811, shortly after Astor's American expedition had established there Fort Astoria, and with it the American claim to the territory of the lower Columbia basin.

David Thompson has been criticized on the ground that the "leisurely" pace of his advance to the Pacific coast resulted in the loss of this territory to the Americans. In his favour it must be said, however, that his surveys, maps, journals, and narratives represent an unparalleled contribution to the geography of the Canadian West.[6] The nature and value of his contribution were not widely recognized until many years after his death in 1857. His name is now well known in the history of Canadian exploration. It has been commemorated by the people of Central Alberta in the naming of the David Thompson Highway, a still incomplete road linking Red Deer and Rocky Mountain House with the Banff-Jasper highway at Saskatchewan Crossing, following Thompson's ori-

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[6] Thompson's "Map of the North West Territory of the Province of Canada" (10'3-1/2" by 6'6") shows the area between 45° and 60° N. Lat. and 84° and 124° W. Long. at a scale of 15 miles to the inch. It was kept for many years by the Northwest Company at Fort William, and is now in the archives of the Province of Ontario. Five other of his maps are in the British Museum. His writings include thirty-nine volumes of journals and eleven volumes of survey and astronomical notes, also now in the archives of the Province of Ontario, and his Narrative, published in 1915 by the Champlain Society.

ginal route through the front range of the Rockies.

During the period from 1800 to 1875 the fur trade continued in the area around Rocky Mountain House, though with many changes. Amalgamation of the independent XY Company with the Northwest Company in 1804 increased the number of partners, requiring expansion of the trade into new territories. This move was further necessitated by the rapid depletion of fur-bearing animals. The Pacific side of the Rockies offered the best prospects for expansion, but the line of supply from Montreal was too long, and soon part of the Pacific trade was going by way of the sea route around Cape Horn to Vancouver. With the union of the Northwest Company and the Hudson's Bay Company in 1821 Acton House was abandoned, and Rocky Mountain House became a Hudson's Bay Company post. Some of the Pacific trade, particularly after the union, went by way of Jasper House and the Yellowhead pass. Thus Rocky Mountain House, instead of being an important link in the chain of the transcontinental fur trade, became an outpost of the interior trade. It continued to operate through most of the declining years of the fur trade, finally closing in 1875, six years after the surrender of Rupert's Land by the Hudson's Bay Company, and seven years before the first agricultural settlers arrived in the Red Deer region.

## 2. Agricultural Settlement

Confederation in 1867 and the construction of the Canadian Pacific Railway as far as Calgary in 1883 provided the

stimuli necessary to initiate agricultural settlement in the Red Deer region. The first settlers were four men who arrived at Red Deer Crossing, on the western edge of the present city, in September 1882.[7] They selected home sites, spent the winter surveying and freighting in other areas, and returned in the summer of 1883 to take out "squatters' rights" on their homesteads. Later in that year the land of the district was surveyed and homesteads were organized in the familiar grid pattern of Western Canada. With the arrival of the railway at Calgary a stage coach route was established between Calgary and Edmonton, and a post office, trading post, and stopping house were established at Red Deer Crossing. Among the settlers was the Rev. Dr. Leonard Gaetz who, with his wife and ten children, arrived from Ontario in the spring of 1884 and took up a homestead in the valley of the Red Deer River on the present site of the city of Red Deer. The part played by this family in the early development of settlement at Red Deer embraced nearly every aspect of life there: farming, trading, saw-milling, education, and the church. They may be regarded as typical of the settlers who developed the central part of the Red Deer region, in that they were English-speaking Canadians from Ontario, and they were primarily interested in building a permanent and stable agricultural community.[8]

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[7] Annie L. Gaetz, The Park Country, Vancouver, 1948, p. 5.

[8] R. W. Dawe, op. cit.

The interests of the settlers were well served by a visit Gaetz made in February 1890 to Ottawa where he reported on the agricultural prospects of the Red Deer district to a parliamentary committee on agriculture.[9] His boundless enthusiasm for his subject prompted some skeptical questions from the committee, but he provided them with convincing evidence in the form of samples of grain grown on his farm at Red Deer. He reported that there was scattered settlement in an area centered on the Edmonton trail, extending about seven or eight miles north-south and three or four miles east-west; he estimated the population of this area to be 150 to 200 people. It appears likely that his report hastened the decision to build the Calgary and Edmonton Railway. The C. and E. Railway Company was essentially a subsidiary of the C. P. R., and its construction was based on government assistance, much as that of the C. P. R. had been. Surveys for the railway were begun in 1890, and the line was built as far as Red Deer in that year. The arrival of the railway marked the beginning of a period of rapid expansion of agricultural settlement in the region.

Though the district immediately around Red Deer was settled primarily by people of English background, there were other ethnic groups represented in the surrounding areas. Probably the best known of these was the group of Icelandic settlers who came from North Dakota in 1888 to found the set-

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[9]Rev. Leonard Gaetz, op. cit.

tlement at Markerville on the Medicine River just above its mouth. The first group consisted of twelve families and three single men, who were later joined by others, including the noted Icelandic poet, Stephan G. Stephansson.[10] Their settlement differed from others of the period in that more emphasis was placed on dairying rather than mixed farming, a cheese factory and a creamery being among the earliest enterprises to be established. Markerville itself has an informal pattern, partly because of the early date of its establishment and partly because it is oriented to the river rather than to a railway or main road. In this respect it differs from the more formal grid pattern of most settlements in the region, which were located on the railway or major roads or both.

The present pattern of agricultural occupance in the region shows a relatively high density (by Western Canadian standards) of farm population in the central part of the region, with lower densities to the east and west (see Figure 10). The lower densities to the east appear to be largely the result of moisture deficiencies and inferior soils. To the west inferior soils and dense forest cover have both contributed to the lower densities of farm population.

Recent changes and trends in density of farm population are difficult to establish from census statistics. First, variations in density are not shown adequately by the

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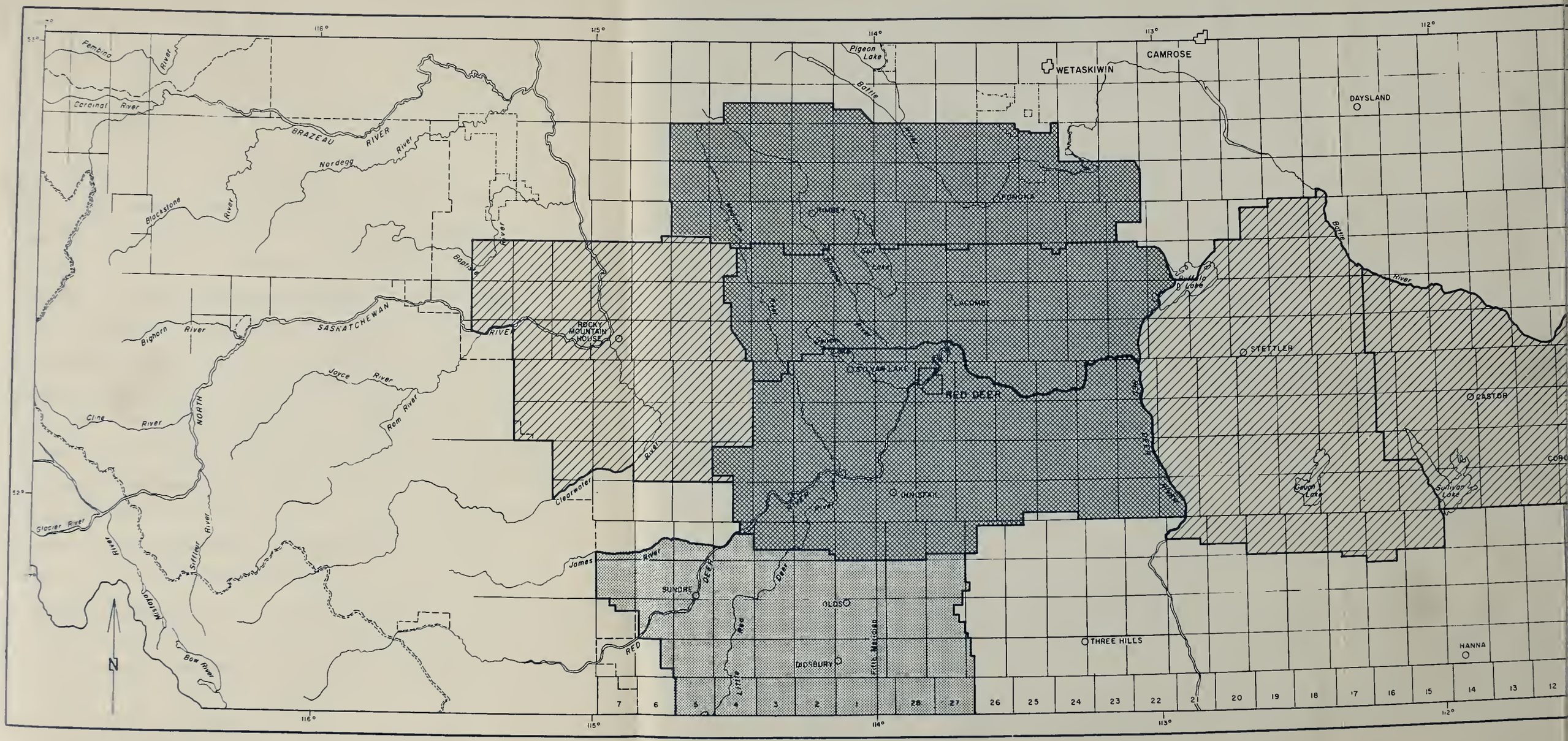
[10]Annie L. Gaetz, op. cit., pp. 69-73.


116°
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Fembina River
Cardinal River
BRAZEAU RIVER
Nordegg River
Blackstone River
Baptiste River
SASKATCHEWAN RIVER
Brazeau River
Joyce River
Cline River
NORTH RAM River
Clearwater River
Glacier River
Siffleur River
MISTOYA River
Bow River
James River
RED DEER RIVER
Pigeon Lake
Battle River
WETASKIWIN
CAMROSE
DAYSLAND
ROCKY MOUNTAIN HOUSE
RIMBEY
PENHOLD
GULL LAKE
LACOMBE
BUFFALO LAKE
STETTLER
SYLVAN LAKE
RED DEER
CASTOR
INNISFAIL
GLEN LAKE
SULLIVAN LAKE
SUNDRE
OLDS
DIDSBURY
THREE HILLS
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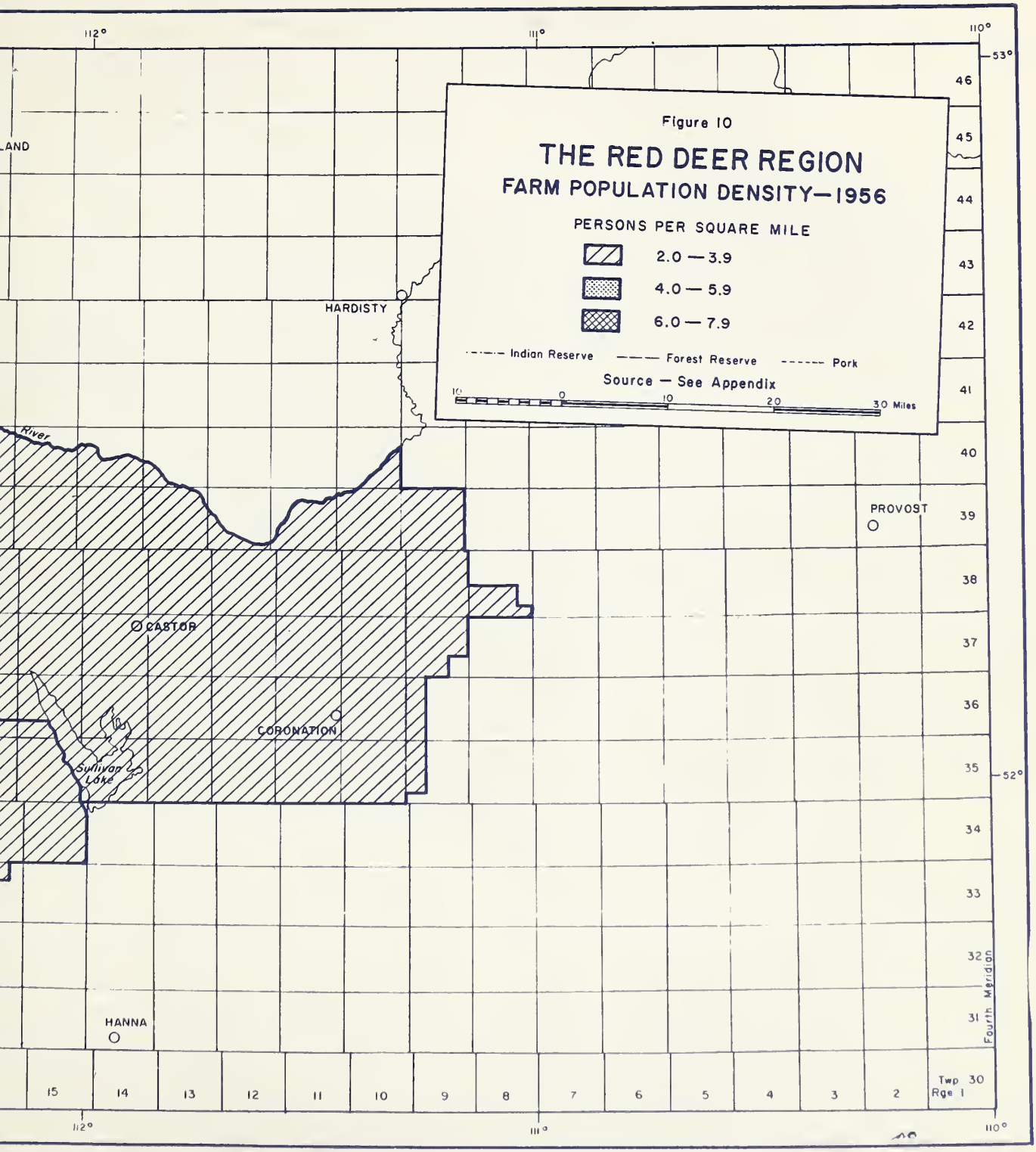
Figure 10
THE RED DEER REGION
FARM POPULATION DENSITY—1956
PERSONS PER SQUARE MILE
2.0 — 3.9
4.0 — 5.9
6.0 — 7.9
Indian Reserve
Forest Reserve
Pork
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
HARDISTY
PROVOST
CASTOR
CORONATION
HANNA
Sullivan Lake
River
Fourth Meridian
Twp 30
Rge 1
46
45
44
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41
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2

census data for farm population because these data are compiled for census sub-divisions, which usually consist of a whole rural municipality or county containing more than a thousand square miles. Second, "farm population" now includes in certain areas people who are at least partly dependent upon work as oil field operators, and thus not entirely supported by farming operations. Finally, rural municipalities in Alberta (and hence census sub-divisions) have undergone drastic reorganization in recent years, so that census data from succeeding years are not available on a comparable basis. An attempt was made to compare the densities of farm population for 1951 and 1956, the two most recent years for which data are available. The result was inconclusive, though it is generally thought that farm population is declining. However, a counter-trend may exist in certain parts of the region where forested land is being cleared. Examples are found in an area of dark grey chernozemic soils southeast of Red Deer (Twp. 36, Rge. 24, W. 4 M.), and in an area of grey wooded podzolic soils southeast of Rocky Mountain House (Twp. 37, Rge. 5, W. 5 M.). Thus agricultural occupance is still expanding in some parts of the region, though it is questionable whether the land in those areas warrants the expense of clearing by means of bulldozers under present economic conditions.

### 3. The City of Red Deer

The location and population of Red Deer were mentioned briefly in Chapter I. Detailed discussion of its location

and site is included in Chapter IV--Transportation Facilities. Changes in the population of the city in relation to other cities of Alberta are shown by Figure 1; changes in relation to other nucleated settlements in the region are shown by Figure 11 and Table 2; and its present population is shown by Figures 2 and 12.

For the purposes of this study the populations of nucleated settlements are considered to be significant indicators of their functional diversity and of their importance to the region. This approach is based on two assumptions: first, that a central-place hierarchy exists, and second, that the various classes of places in the hierarchy tend towards particular levels of population. These assumptions have been stated by various authors and have been tested empirically by the recent work of Berry and Garrison.[11]

In Alberta as a whole there appears to be at the top of the hierarchy a discrete group consisting of the two major cities, Calgary and Edmonton, whose position has not yet been approached by any other place (see Figure 1). Below this is another group which includes Lethbridge and Medicine Hat, regional centers which until about 1946 were more than three times as large as any smaller place.[12] The upper portion of

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[11]Brian J. L. Berry and William L. Garrison, "The Functional Bases of the Central-Place Hierarchy," Economic Geography, Vol. XXXIV, April, 1958, pp. 145-154.

[12]Suburban towns such as Jasper Place, on the western margin of Edmonton, have not been considered separately because they are separate only administratively and not functionally, and are contiguous with the major cities.

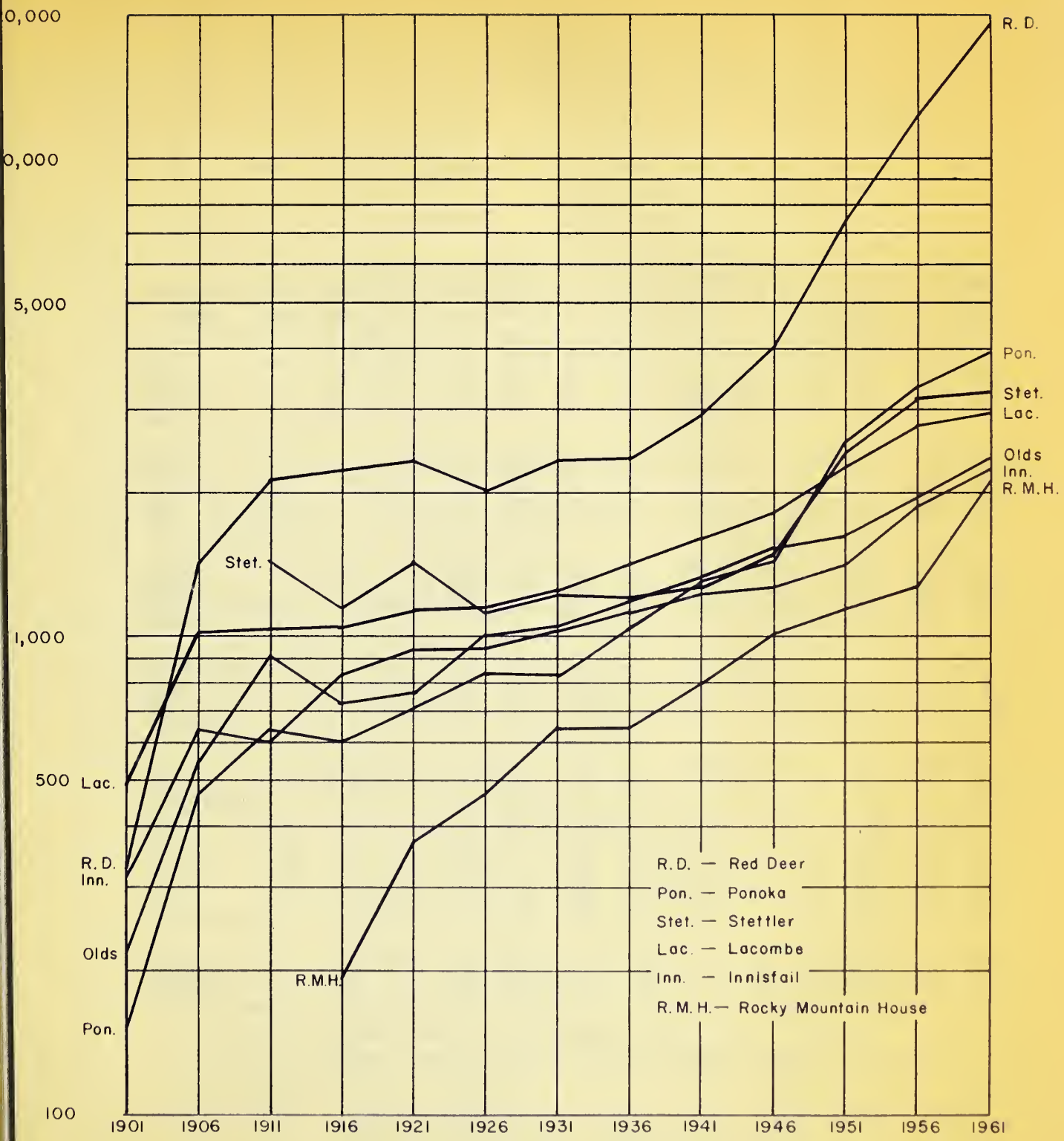



Figure 11 — POPULATION GROWTH IN THE RED DEER REGION — SETTLEMENTS OVER 2,000 IN 1961

Source — See Appendix

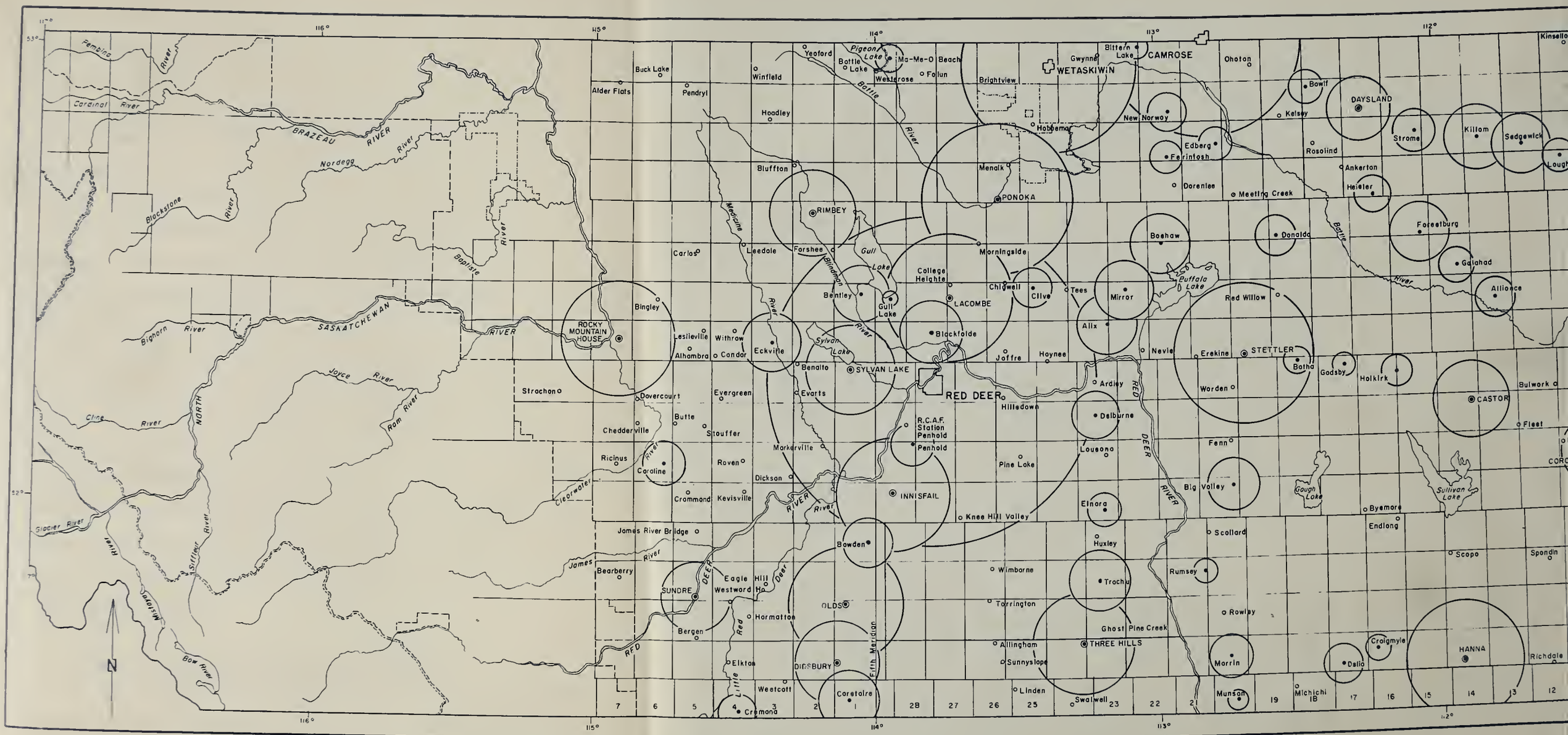
TABLE 2

POPULATION OF INCORPORATED SETTLEMENTS IN THE RED DEER REGION

| Place | 1901 | 1906 | 1911 | 1916 | 1921 | 1926 | 1931 | 1936 | 1941 | 1946 | 1951 | 1956 | 1961 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alix | . . | . . | 267 | 182 | 282 | 229 | 241 | 333 | 360 | 428 | 461 | 517 | 621 |
| Bashaw | . . | . . | . . | 227 | 433 | 418 | 385 | 423 | 494 | 511 | 603 | 597 | 602 |
| Bentley | . . | . . | . . | 146 | 222 | 211 | 233 | 250 | 279 | 362 | 439 | 536 | 588 |
| Blackfalds | . . | 156 | 150 | 105 | 93 | 105 | 84 | 105 | 113 | 119 | 154 | 340 | 477 |
| Botha | . . | . . | . . | 77 | 130 | 128 | 107 | 98 | 111 | 112 | 98 | 102 | 110 |
| Bowden | . . | 171 | 178 | 139 | 222 | 202 | 233 | 270 | 234 | 273 | 277 | 296 | 425 |
| Caroline | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | 296 | 311 |
| Carstairs | . . | 297 | 270 | 348 | 328 | 381 | 387 | 356 | 371 | 385 | 468 | 449 | 639 |
| Castor | . . | . . | 1,659 | 755 | 710 | 651 | 634 | 592 | 625 | 647 | 798 | 958 | 1,019 |
| Clive | . . | . . | . . | 115 | 232 | 208 | 215 | 242 | 224 | 227 | 241 | 249 | 250 |
| Consort | . . | . . | . . | 131 | 166 | 196 | 299 | 252 | 265 | 325 | 396 | 434 | 552 |
| Coronation | . . | . . | . . | 456 | 645 | 713 | 738 | 605 | 581 | 633 | 738 | 784 | 854 |
| Delburne | . . | . . | . . | 104 | 215 | 151 | 193 | 236 | 308 | 379 | 395 | 429 | 429 |
| Didsbury | . . | 447 | 726 | 640 | 842 | 785 | 801 | 846 | 892 | 980 | 1,180 | 1,227 | 1,222 |
| Eckville | . . | . . | . . | . . | . . | 178 | 169 | 159 | 135 | 195 | 379 | 456 | 568 |
| Elnora | . . | . . | . . | . . | . . | . . | 153 | 149 | 195 | 201 | 211 | 177 | 213 |
| Erskine | . . | . . | 131 | 114 | 198 | 160 | 174 | 164 | 172 | . . | . . | . . | . . |
| Gadsby | . . | . . | 213 | 153 | 150 | 162 | 144 | 139 | 141 | 120 | 128 | 145 | 98 |
| Gull Lake | . . | . . | . . | . . | . . | . . | . . | . . | 21 | 39 | 32 | 32 | 40 |
| Halkirk | . . | . . | . . | 97 | 146 | 165 | 160 | 139 | 118 | 121 | 148 | 209 | 167 |
| Innisfail | 317 | 643 | 602 | 838 | 941 | 944 | 1,024 | 1,124 | 1,223 | 1,272 | 1,417 | 1,883 | 2,233 |
| Lacombe | 499 | 1,015 | 1,029 | 1,047 | 1,133 | 1,151 | 1,259 | 1,414 | 1,603 | 1,808 | 2,277 | 2,747 | 2,942 |
| Ma-Me-O Beach | . . | . . | . . | . . | . . | . . | . . | . . | . . | . . | 98 | 137 | 143 |
| Mirror | . . | . . | . . | 285 | 381 | 431 | 534 | 585 | 570 | 562 | 635 | 591 | 562 |
| Olds | 218 | 554 | 917 | 730 | 764 | 1,003 | 1,056 | 1,197 | 1,337 | 1,521 | 1,617 | 1,980 | 2,394 |
| Penhold | . . | 76 | 94 | 96 | 127 | 161 | 125 | 94 | 183 | 134 | 174 | 213 | 307 |
| Ponoka | 151 | 473 | 642 | 604 | 712 | 842 | 836 | 1,045 | 1,306 | 1,468 | 2,574 | 3,387 | 3,907 |
| Red Deer | 323 | 1,418 | 2,118 | 2,203 | 2,328 | 2,021 | 2,344 | 2,384 | 2,924 | 4,042 | 7,575 | 12,338 | 19,147 |
| Rimbey | . . | . . | . . | . . | 319 | 280 | 304 | 313 | 410 | 634 | 757 | 980 | 1,249 |
| Rocky Mtn. Ho. | . . | . . | . . | 191 | 375 | 467 | 646 | 652 | 800 | 1,017 | 1,147 | 1,285 | 2,258 |
| Stettler | . . | . . | 1,444 | 1,168 | 1,416 | 1,127 | 1,219 | 1,202 | 1,295 | 1,499 | 2,442 | 3,359 | 3,553 |
| Sylvan Lake | . . | . . | . . | 115 | 180 | 295 | 416 | 652 | 805 | 971 | 985 | 1,114 | 1,337 |
| Veteran | . . | . . | . . | 102 | 157 | 167 | 180 | 180 | 190 | 191 | 206 | 241 | 240 |

Source: Canada, Dominion Bureau of Statistics, Census of Canada, Ottawa.

Note: Figures for 1961 are preliminary and subject to upward revision by approximately one per cent.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Bighorn River
SASKATCHEWAN RIVER
Joyce River
Ram River
Cline River
NORTH RAZEL RIVER
Glacier River
Siffleur River
Highwood River
Bow River
Alder Flats
Buck Lake
Pendryl
Winfield
Yeoford
Pigeon Lake
Bottle Lake
Ma-Me-O Beach
Westerose
Folun
Hoadley
Bluffton
Battle River
Brightview
Hobbema
WETASKIWIN
Gwynne
Bittern Lake
CAMROSE
Ohaton
New Norway
Bowlf
Kelsey
DAYSLAND
Strome
Killam
Sedgewick
Edberg
Ferintosh
Rosalind
Ankerton
Heisler
Dorenlee
Meeting Creek
Menalk
PONOKA
RIMBEY
Medicine River
Carlos
Leedale
Forshee
Gull Lake
Morningside
Boshaw
Donalda
Forestburg
Galahad
Alliance
Battle River
College Heights
Chigwell
Clive
Tees
Mirror
Buffalo Lake
Red Willow
Bentley
Gull Lake
LACOMBE
Blackfalds
Alix
Bingley
ROCKY MOUNTAIN HOUSE
Lesieville
Alhambra
Withrow
Condor
Eckville
Sylvan Lake River
Joffre
Haynee
Nevis
Erskine
STETTLER
Botha
Gadsby
Holkirk
Bulwark
CASTOR
Fleet
Benalto
SYLVAN LAKE
Strachan
Dovercourt
Evergreen
Evarts
RED DEER
Hilldown
Ardley
Delburne
Worden
Fenn
Lousana
Chedderville
Butte
Stauffer
Markerville
R.C.A.F. Station Penhold
Penhold
Pine Lake
Ricinus
Caroline
Roven
Dickson
Clearwater River
Red Deer River
INNISFAIL
Big Valley
Gough Lake
Sullivan Lake
Byemoor
Endiang
Elnora
Knee Hill Valley
Crammond
Kevisville
James River Bridge
James River
Bearberry
SUNDRE
Eagle Hill
Westward Ho
Bowden
Huxley
Scollard
Scopo
Spondin
Wimborne
Trochu
Rumsey
Torrington
Rowley
Ghost Pine Creek
OLDS
Hormaton
Bergen
Elkton
Red Deer River
Little Red Deer River
DIDSBURY
Fifth Meridian
Allingham
Sunnyslope
THREE HILLS
Morrin
Craigmyle
Dalio
HANNA
Richdale
Linden
Swalwell
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17
16
15
14
13
12
N

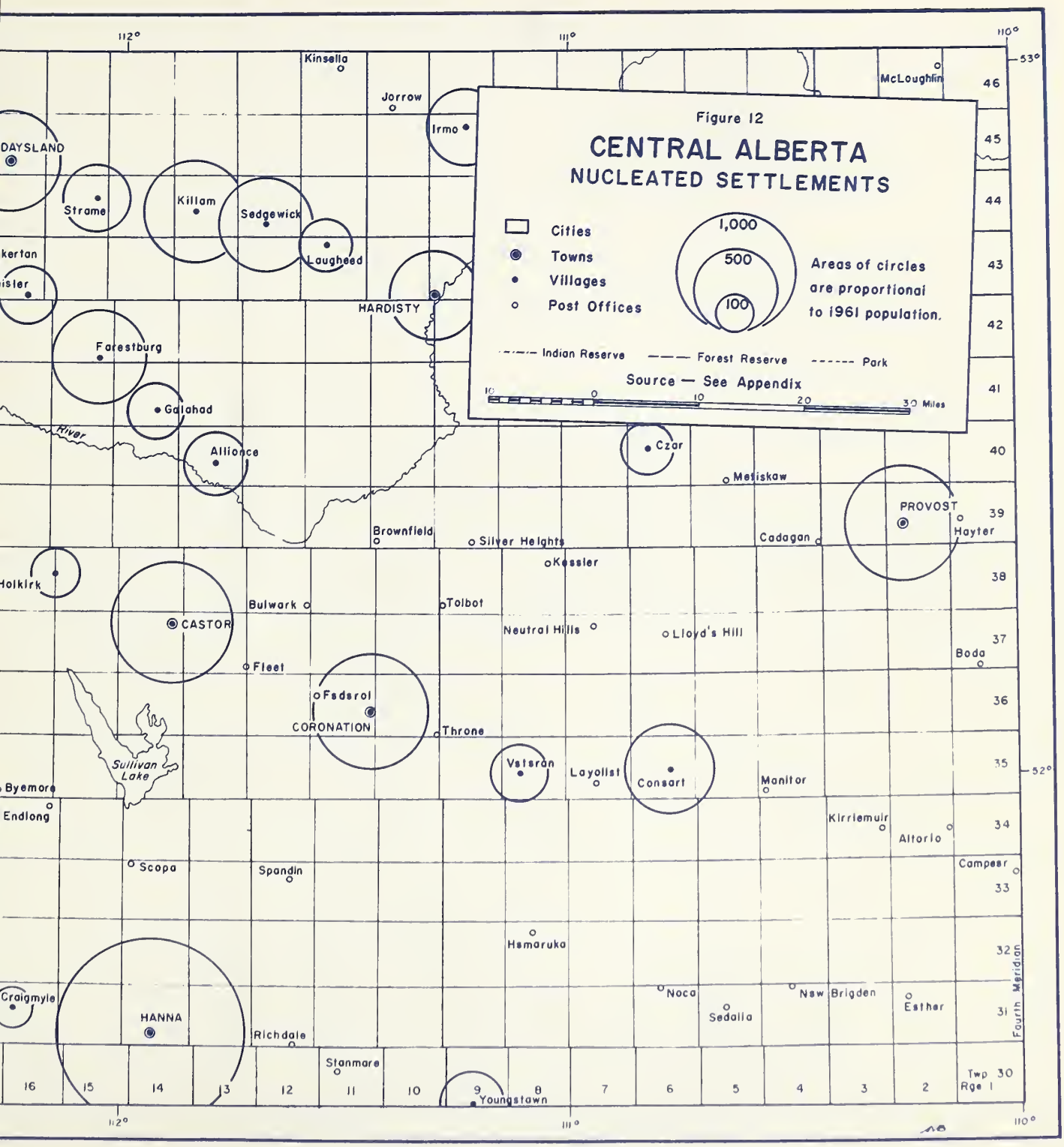


Figure 12
CENTRAL ALBERTA
NUCLEATED SETTLEMENTS
Cities
Towns
Villages
Post Offices
1,000
500
100
Areas of circles are proportional to 1961 population.
Indian Reserve
Forest Reserve
Park
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
Kinsella
Jorrow
Irmo
McLoughlin
DAYSLAND
Strome
Killam
Sedgewick
Laughheed
HARDISTY
Forestburg
Galahad
River
Alliance
Czar
Metiskaw
PROVOST
Hayter
Brownfield
Silver Heights
Cadagan
Kessler
Holkirk
Bulwark
Talbot
CASTOR
Neutral Hills
Lloyd's Hill
Boda
Fleet
Fedsrol
CORONATION
Throne
Sullivan Lake
Byemoor
Endlong
Vetsrán
Layollst
Consart
Manitor
Kirriemuir
Altorlo
Scopa
Spandin
Campesr
Hsmaruka
Noca
Sedalia
New Brigden
Esther
Craigmyle
HANNA
Richdale
Stanmore
Youngstawn
Fourth Meridian
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
Twp 30
Rge 1

the next lower group in the hierarchy of the whole province is represented by the other cities over 5,000 in 1961, including Wetaskiwin, Camrose, Grande Prairie, and Red Deer. However, since 1946 the growth of Red Deer's population has been consistently more rapid than that of any other place of comparable population. Thus it appears that Red Deer is in the process of moving from the third group to the second group. The significance of this move seems to be that Red Deer is developing as the major regional center between Calgary and Edmonton, thus occupying in its region a position similar to those of Lethbridge and Medicine Hat in their regions. It is possible that Grande Prairie is in an early stage of a similar move; however, it is outside the scope of this study.

The position of Red Deer in relation to the other places within the Red Deer region was not clear during the period up to about World War II. Its population was approximately double that of its nearest rivals. However, Red Deer's population in 1961 was nearly five times that of Ponoka, the next largest place in the region, and its consistently high rate of growth from 1946 to 1961 suggests that the margin will continue to increase.

### 4. Other Nucleated Settlements in the Region

As might be expected, the differentiation of hierarchical groups on the basis of population becomes more complicated with the smaller places because there are more of them. A further complication is that census data show separately

only those nucleated settlements which are incorporated as villages, towns, or cities. As a result some small settlements do not appear as separate entities in the data, even though their population may be greater than those of the smaller incorporated settlements. For these reasons the smallest settlements were not grouped according to population. An indication of their pattern is provided by Figures 12 and 13. Figure 12 shows the various nucleated settlements in Central Alberta, with circles of areas proportional to the populations of incorporated settlements. Figure 13 shows in numerical order the populations of nucleated settlements within the Red Deer region.

The graph indicates a clear break between places with populations over 2,000 and those whose populations are lower. The over-2,000 group includes Innisfail, Rocky Mountain House, Olds, Lacombe, Stettler, and Ponoka. These are local service and market towns, primarily oriented to agriculture, though there is some variation in function. For example, Rocky Mountain House also has functions oriented to the forested areas to the west, such as saw mills and offices of the Alberta Department of Lands and Forests. Places smaller than 2,000 are in general local service and market centers of less diversified function. Within this group too there is some degree of specialization of function. For example, Sylvan Lake is a summer resort as well as an agricultural center.

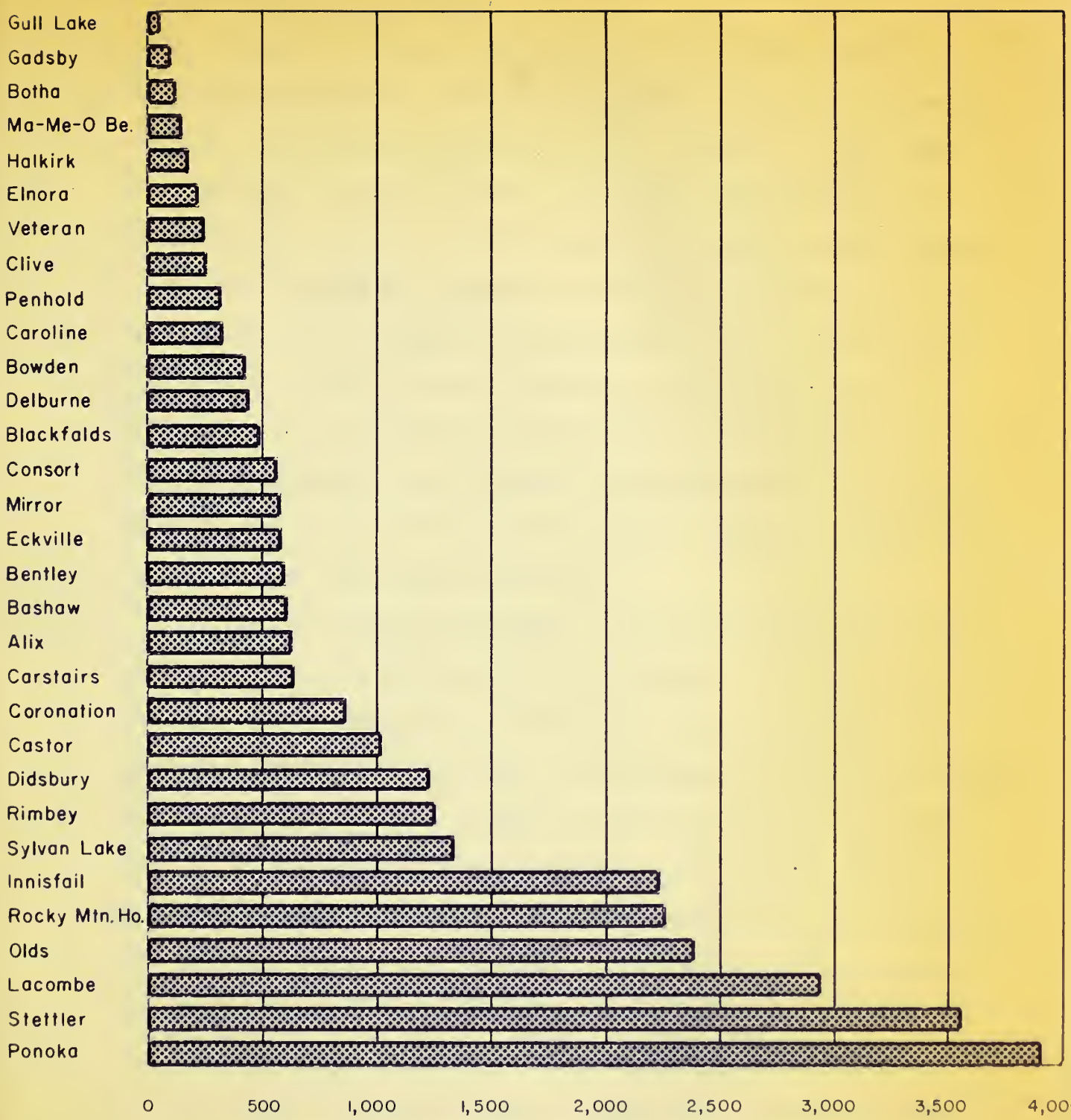


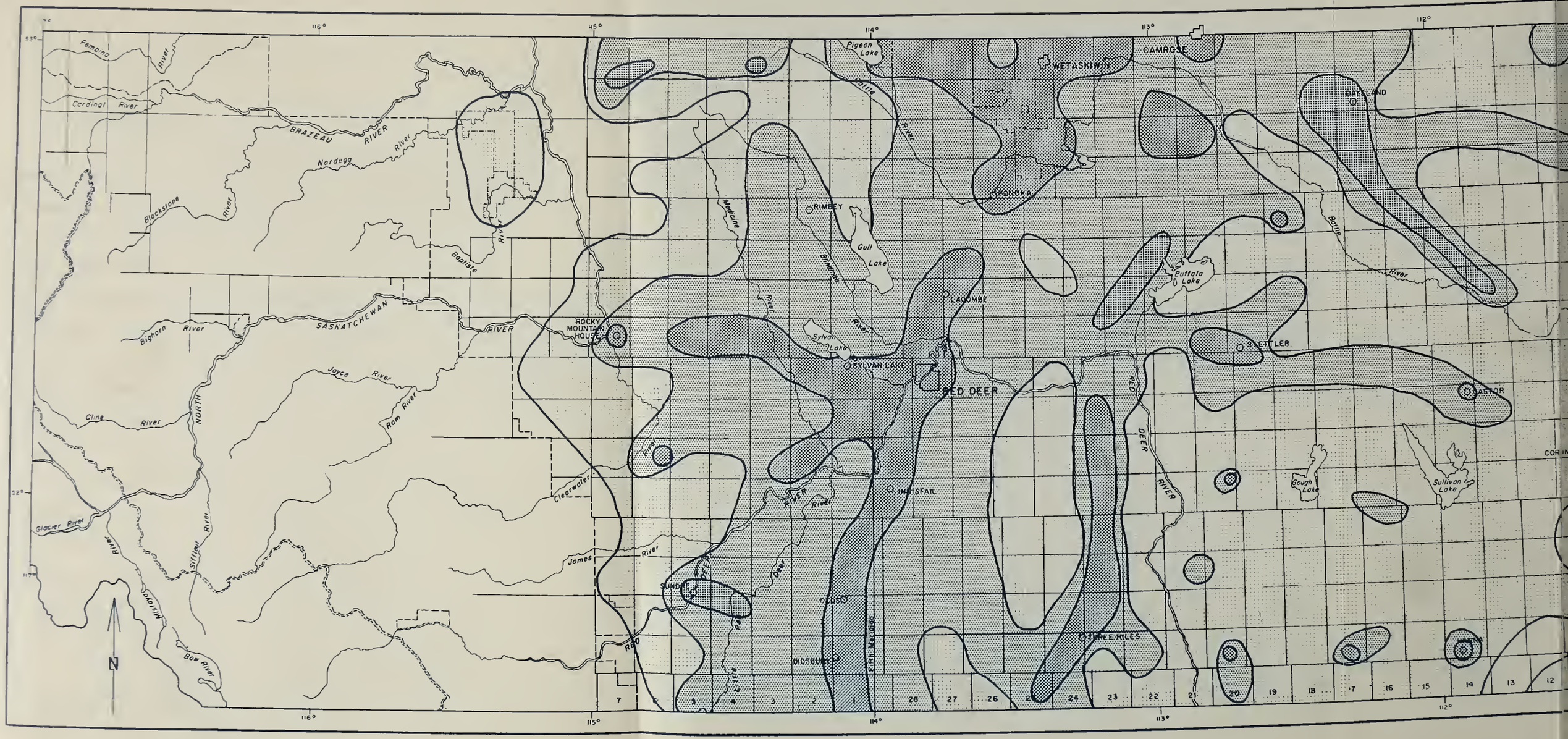

Figure 13 — 1961 POPULATION OF INCORPORATED SETTLEMENTS IN THE RED DEER REGION

Source — See Appendix

5. The Region as a Whole

Figure 14 shows the density of the total population for Central Alberta. The general pattern is one of concentration in the central area with a sharp decrease to the west and a gradual decrease to the southeast. This pattern is largely the result of the physical limitations on agriculture. To the west these are imposed by podzolic soils and dense forest cover. In addition, the presence of the forest reserve to the west of the Red Deer region limits agriculture to a few ranches, and restricts the development of forestry. To the east limitations are imposed by scanty precipitation and inferior soils, most with little organic content, some of light texture, and some solonetzic.

The more detailed pattern reflects some of the physical limitations on agriculture; for example, densities are low in areas of dark grey soils to the east of Lacombe, Red Deer, and Innisfail. However, the presence of nucleated settlements has the strongest effect on the distribution of population. The patterns of high densities which result are of course related to the transportation routes on which these nucleated settlements are located. This aspect will be discussed in the following chapter. A further variation worth mentioning, though it is just outside the Red Deer region, is the pattern of high densities on the Indian reserves between Wetaskiwin and Ponoka. Here population densities are significantly higher than on surrounding agricultural land of similar quality.


116°
115°
114°
113°
112°
52°
Pembina River
Cardinal River
BRAZEAU RIVER
Nordegg River
Blackstone River
Baptiste River
SASKATCHEWAN RIVER
Bighorn River
Joyce River
Cline River
NORTH RAM River
Clearwater River
Glacier River
Siffleur River
MIETTE River
Bow River
Pigeon Lake
Battle River
WETASKIWIN
CAMROSE
BATTLEFORD
RIMBEY
Medicine River
Gull Lake
Blindman River
LACOMBE
Buffalo Lake
Battle River
ROCKY MOUNTAIN HOUSE
Sylvan Lake
SYLVAN LAKE
RED DEER
RED DEER RIVER
Gough Lake
Sullivan Lake
Red Deer River
Dickson Dam
THREE HILLS
7 6 5 4 3 2 1 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12
N

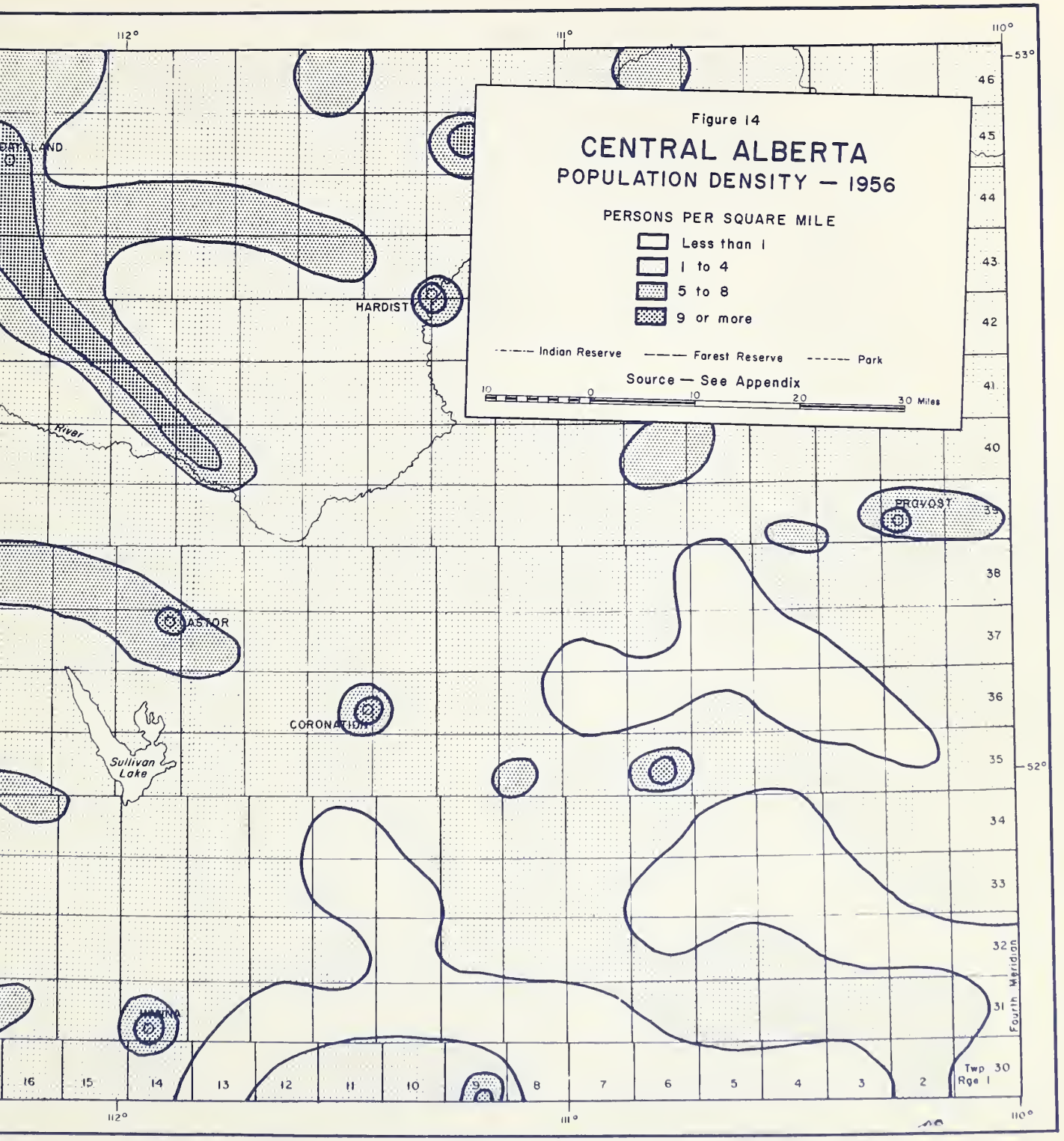


Figure 14
CENTRAL ALBERTA
POPULATION DENSITY — 1956
PERSONS PER SQUARE MILE
Less than 1
1 to 4
5 to 8
9 or more
Indian Reserve
Forest Reserve
Park
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
HARDISTY
PROVOST
CASTOR
CORONATION
Sullivan Lake
River
Fourth Meridian
Twp 30
Rge 1
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
16
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14
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1

# CHAPTER IV

## TRANSPORTATION FACILITIES

### 1. The Early Trails

The importance of transportation facilities to the development of Red Deer and the Red Deer region can hardly be overestimated. The main transportation routes of the region did not originate in the routes of the fur trade. As has been suggested in Chapter III, Rocky Mountain House was the only important fur-trading post in the region. David Thompson's overland approach followed approximately the route of the present east-west railways and highway in the region, and this route may have been followed by Indians trading at Rocky Mountain House, but as the trade developed the North Saskatchewan River was the most important route servicing it.

The route of greatest importance to Red Deer and its region today is the Calgary-Edmonton trail.[1] One authority has claimed that the trail originated in pre-historic times as part of the migration route from Asia. There is little evidence for this view,[2] though the route was almost certainly used by the Indians before European incursion began. The

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[1]The highway between Calgary and Edmonton is still known locally as the Calgary trail or the Edmonton trail, according to the direction of travel.

[2]Hugh A. Dempsey, "The Calgary-Edmonton Trail," Alberta Historical Review, Vol. 7, No. 4, Autumn 1959, pp. 16-17.

trail's recorded history begins in 1873 when it was used by the Rev. John McDougall and his brother David to travel by cart from Fort Edmonton south to Morley on the Bow River west of Calgary. During the next ten years it gained some importance as a link in the route between Fort Edmonton and Fort Benton, Montana, the head of navigation on the Missouri River.

The arrival of the Canadian Pacific Railway in Calgary in 1883 suddenly converted the Calgary-Edmonton trail into a major route. Passengers, mail, and light freight were carried by a regular weekly stage coach between Calgary and Edmonton. Freight of all kinds was carried from the railhead north to Edmonton and beyond by trains of Red River carts and by horse-drawn wagons. At its maximum the annual volume of freight exceeded 3,000,000 pounds and may have reached 5,000,000.[3] The stage coach was scheduled to make the trip in five days; the freighters took longer. As a result stopping-houses were needed along the route. The major ones were established at or near the present sites of Olds, Red Deer, Ponoka, and Wetaskiwin. It is significant that today three of these settlements--Red Deer, Ponoka, and Wetaskiwin--are the largest on the Calgary-Edmonton route; and the fourth, Olds, is exceeded in population only by Lacombe.[4]

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[3] Ibid., p. 20.

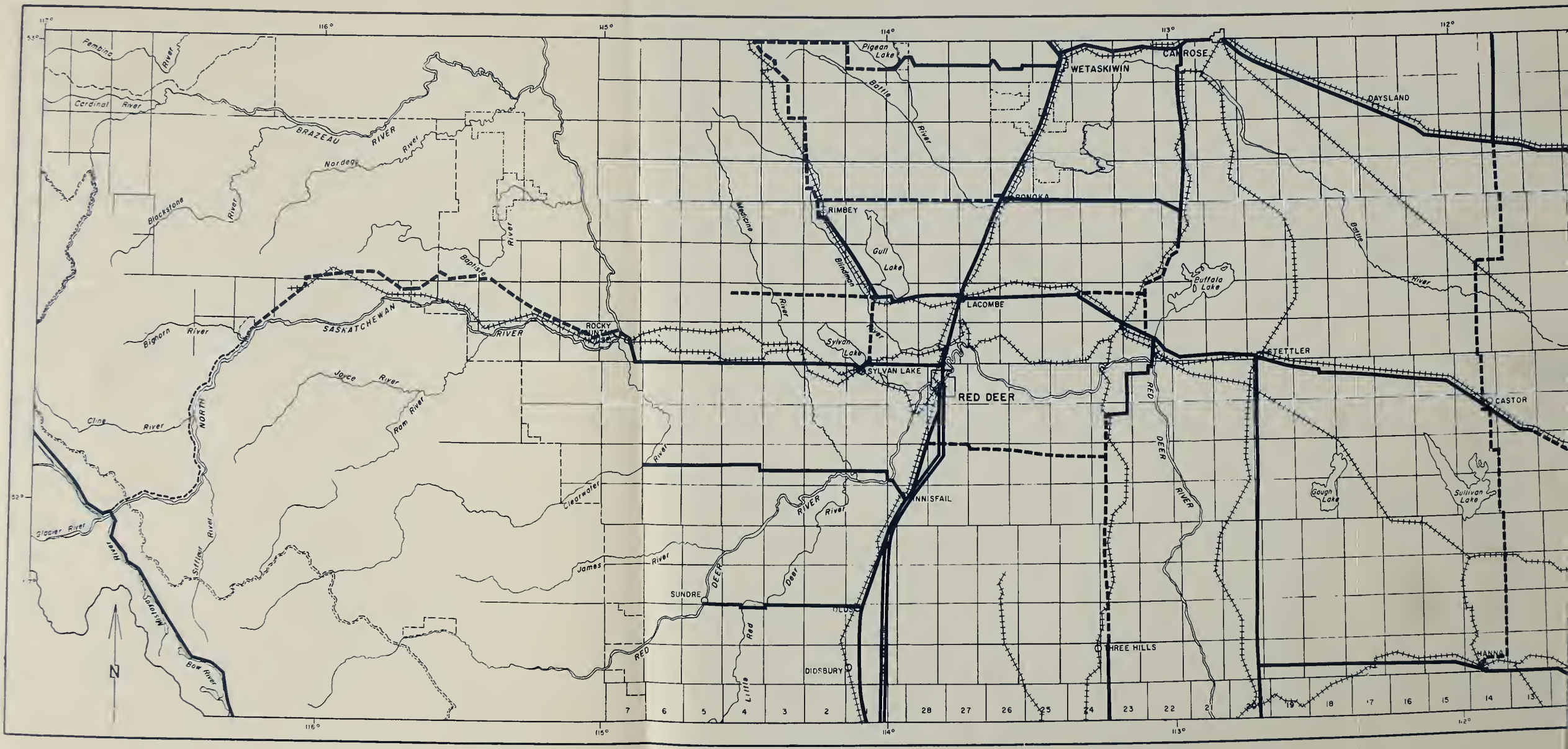
[4] Lacombe's greater size may be accounted for partly by the fact that, like Red Deer and Wetaskiwin, it is served by an east-west railway as well as the main north-south line, while Olds is not.

While the route in most places followed the shortest line between Calgary and Edmonton, its location was influenced by several other factors. The parkland, with its western margin approximately along the route, offered an easier way than the forest to the west. Hilly or rough land, especially to the east, was generally avoided. Stream crossings along the route were located where valleys were shallow and fords relatively easy, particularly at the two major streams, the Red Deer and Battle Rivers. Both of these crossings were located where the streams flowed in the pre-glacial valley of the Red Deer. At the Battle crossing the pre-glacial channel had been fairly deeply incised, since here it crossed from the more resistant Tertiary formations to the weaker formations of the Upper Cretaceous. However, glaciofluvial deposits now fill the channel almost to the elevation of the adjacent land. At Red Deer the river still flows in its pre-glacial channel, here a broad, mature valley.

## 2. The Railways

The building of the Calgary and Edmonton Railway to Red Deer in 1890 and on to Strathcona (South Edmonton) in the following year ended the trail's stage-coach era. But the railway followed within a few miles the route of the Calgary-Edmonton trail, both to serve the settlements which had been established, and because of the same factors which had influenced the trail's location (see Figure 15).

The site of the railway bridge over the Red Deer River


117°
116°
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112°
52°
Fembing River
Cardinal River
BRAZEAU RIVER
Nordegg River
Blackstone River
Baptiste River
Bighorn River
SASKATCHEWAN RIVER
Joyce River
Cline River
NORTH RAM River
Clearwater River
Glacier River
Mistaya River
Siffleur River
James River
RED DEER RIVER
Little Red Deer River
Bow River
SUNDRE
DIDSBURY
OLDS
INNISFAIL
THREE HILLS
ROCKY MOUNTAIN HOUSE
RIMBEY
Pigeon Lake
WETASKIWIN
Battle River
Medicine River
Gull Lake
Blindman River
Sylvan Lake
SYLVAN LAKE
LACOMBE
RED DEER
CANROSE
DAYSLAND
Buffalo Lake
STETTLER
CASTOR
Gough Lake
Sullivan Lake
7 6 5 4 3 2 1 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13
N

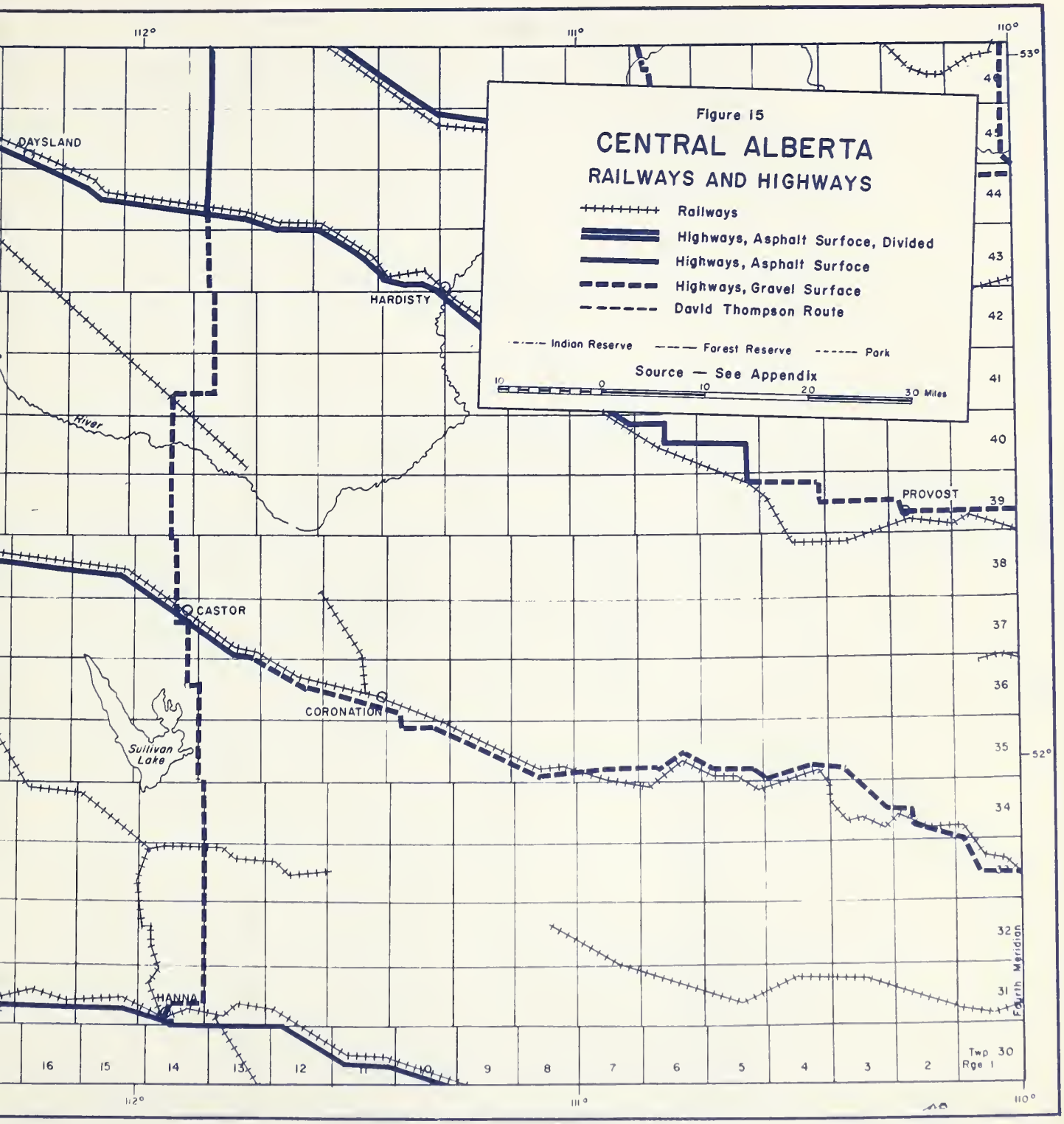
Figure 15
CENTRAL ALBERTA
RAILWAYS AND HIGHWAYS
Railways
Highways, Asphalt Surfoce, Divided
Highways, Asphalt Surfoce
Highways, Gravel Surface
David Thompson Route
Indian Reserve
Forest Reserve
Park
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
DAYSLAND
HARDISTY
PROVOST
CASTOR
CORONATION
Sullivan Lake
HANNA
River
Fourth Meridian
Twp 30
Rge 1

was a matter of some controversy, and it is of interest for this study because it effectively fixed the site of the city of Red Deer. Apparently the railway company surveyed three alternative crossings of the river. One was at the site of the present bridge, where the Gaetz property was situated. Another was about three miles upstream at Red Deer Crossing, where the old trail crossed at the best ford. The third was downstream from the present bridge. The settlement of the mater was described by Gaetz's daughter as follows:

> . . . a meeting with the contractors, Mackenzie and Mann, was called at the home of Dr. Gaetz, who was delighted to act in the interest of the settlers. The Gaetz family pooled their interests and Dr. Gaetz, his son, Hal, and brother, Isaac, offered the contractors one half their holdings, which consisted of 1,200 acres, as an inducement to choose the present town site. The extra land offer did the trick.[5]

Settlers at the old crossing moved to the new town site and the building of Red Deer began.

At the site thus chosen for Red Deer the floodplain of the post-glacial valley is more than a mile wide, providing ample room for the initial growth of the settlement, though the city has now expanded onto higher land on both sides of the river. This site is not especially superior to alternative sites a few miles up or down the valley, but the location of the city in this general portion of the valley was greatly dependent upon the surface configuration of the region (see Figure 5). There is no convenient alternative route for the railway to the east or to the west. Any other choice

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[5]Annie L. Gaetz, op. cit., pp. 50-51.

would have added considerably to the length of the route or to the difficulty of construction. The upland to the east of Innisfail, Red Deer, and Lacombe is hilly and is bisected by the deepest portion of the gorge of the Red Deer River. To the west of Red Deer the land is relatively flat, but a north-south railway here would have encountered a deep portion of the Blindman valley or the high ridges north of Sylvan Lake. Avoidance of these obstacles would have necessitated either a circuitous route or a displacement of the route farther west to the Medicine valley and west of Pigeon Lake. Hence the railway followed the only convenient route through the system of ridges and valleys, trending northwest-southeast, which occupies the central part of the Red Deer region. This is the route along which the pre-glacial valley of the Red Deer River had cut across the ridge-and-valley system. In view of these locational factors Red Deer may be described as a type of gap-town. While the "gap" is not as apparent as the one in which Guildford, for example, is located,[6] it nevertheless seems to be the primary locational factor for the Calgary-Edmonton route where it crosses the Red Deer region.

The Calgary-Edmonton railway line has continued to be the most important in the Red Deer region. Its significance for the city of Red Deer declined somewhat after World

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[6] Arthur E. Smailes, The Geography of Towns, Hutchinson and Co., London, 1960, pp. 42-44.

War II when the change to diesel locomotives brought about the closing of the roundhouse where the old steam locomotives had been serviced at Red Deer. While passenger traffic on Canadian railways has declined during the past decade because of competition from road and air travel, this line has maintained three passenger trains daily in each direction by the introduction of rail diesel cars. These units make the trip between the two major cities, with six regular stops between, in three and one-half hours. The same trip takes about four hours by car, four and one-quarter hours by bus, and about two and one-half hours--including ground transportation time--by air.

Another north-south railway of secondary importance to the region parallels the C. P. R. line about 25 to 30 miles to the east. It was built between 1910 and 1915 as a part of the Grand Trunk system, which in 1917 became part of the Canadian National Railways. This is now the main C. N. R. line between Calgary and Edmonton, serving Three Hills, Delburne, Alix, Mirror, and Camrose. The line crosses the Red Deer River about 25 miles east of Red Deer at the only convenient bridging point for 100 miles downstream from Red Deer. The southern portion of its route is through rolling land which necessitates many more curves than are found on the C. P. R. line. The mileage between Calgary and Edmonton is 232, as against 194 for the C. P. R., and the present daily passenger train--also a diesel car--takes five hours to make the run. Twenty miles farther to the east another north-south line was

built through Stettler by the Canadian Northern Railway during the same period, and it too became a part of the Canadian National system.

The first east-west railway in the region was the C. P. R. line from Lacombe to Coronation, built between 1905 and 1911. This line crosses the Tertiary upland east of Lacombe in a series of valleys, including a major glacial spillway northwest of Alix. Its function has always been to serve the agricultural settlements through which it passes rather than places outside the region.

About 1912 the Canadian Northern Railway built a line which joins Hanna, Alix, Sylvan Lake, and Rocky Mountain House to major coal deposits at Brazeau in the foothills about fifty miles west of Rocky Mountain House, just north of the North Saskatchewan River. For many years the mines at Brazeau (Nordegg) were a major source of coal for the railways in Alberta. Since World War II the demand for coal has declined as a result of dieselization of the railways and the use of natural gas for heating. The coal mining settlement is now abandoned and the railway line does not operate west of Rocky Mountain House. Just northeast of Red Deer this line crosses two major valleys. The Blindman River is bridged by a trestle 100 feet high, and the northward diversion required to cross the pre-glacial valley of the Red Deer River adds about six miles to the route.

This line also became a part of the Canadian National system and continues to serve a number of agricultural settle-

ments. It was linked in 1920 with the city of Red Deer by a branch which crossed the Red Deer River one-half mile east of the C. P. R. bridge. However, the C. N. R. bridge was abandoned after flood damage some twenty years after its construction, and the C. N. R. then gained access to Red Deer via the C. P. R. line. In 1960 the old C. N. R. route into the city came into use again with the development of an industrial park on the north side of the river. Thus the line continues to serve industrial and commercial customers as well as agricultural communities.

About the same time as this east-west railway was built another line was built by the Alberta Central Railway from Red Deer to Rocky Mountain House. It later became a part of the C. P. R. The two lines are in some places less than a mile and nowhere more than ten miles apart. Attempts to discontinue service to communities along either line have met strong opposition from local residents, for example at Benalto early in 1962. The proximity of these two railway lines is a good example of the wastefulness which marked much railway construction in Western Canada during the period immediately before World War I.

The most recently constructed railway line in the retion is a branch of the C. P. R. which loops westward from the main line at Lacombe, then up the Blindman valley through Rimbey, and back to the main line again at Leduc, twenty miles north of Wetaskiwin. This line was built during the 1920's to serve agricultural communities which were then developing,

and some lumbering operations to the northwest of the Red Deer region.

None of the railway lines in the region now carries mail and few carry express, these services having been taken over by trucks and buses. The only passenger services are those of the three north-south lines mentioned earlier, and a mixed train which runs three days per week on the C. P. R. line through Rimbey. Freight going out of the region consists mostly of grain and livestock, and that coming into the region is primarily heavy or bulky manufactured products for which rail freight rates are lower than truck rates. An added source of freight during the past decade has been crude oil produced from minor fields not served by pipelines. Some oilfield requirements, such as drilling mud additives, are brought in by rail.

3. Roads and Highways

After the eclipse of the Calgary-Edmonton trail by the railway at the end of the nineteenth century this road ceased for a time to play an important role as a route through the Red Deer region. It served instead as one of a number of rudimentary roads which linked early settlements on the railways with their immediate localities. While a few settlers travelled as much as fifty miles from the railways to homestead, most stayed within ten to fifteen miles. During the same period--the first two decades of the twentieth century--the grid of local roads was also developing to serve

horse-drawn vehicles as well as early cars and trucks. This grid was based on the survey system used throughout Western Canada which reserved sixty-six-foot road allowances spaced at one-mile intervals in an east-west direction and two-mile intervals in a north-south direction. As land was settled and fenced these allowances gradually came into use as unimproved roads except where the terrain did not permit their use.

The introduction of motor vehicles brought demands for improvement of the road system by municipal and provincial governments. The provincial government began the development of a highway system to serve the settlements whose locations had been chosen in many instances by the railway companies. As a result the highway network tended to parallel the routes of the railways. Municipal governments were responsible for all other roads, and they seldom chose locations other than the surveyed road allowances except for minor local diversions.

The highway system extended rapidly throughout the region, but the quality of roads improved slowly until about 1947. This was partly the result of lack of funds combined with large mileages, and partly because construction methods were not well adapted to soil and climatic conditions. A recurring problem was rapid deterioration of the roads in the spring of each year when "the frost was leaving the ground". Until fairly recently it was not uncommon to see a heavy truck completely mired down on a graded and gravelled "main highway". It was finally realized that the problem could be alleviated by banning all heavy traffic from roads for a few

weeks in the spring, and this practice is now rigidly followed by both provincial and municipal authorities. In the same period municipal governments began to grade and gravel local roads, but progress was extremely slow because of the vast mileage imposed by the grid system as compared with the limited funds available. In addition, local roads were often impassable to motor vehicles for many weeks during winters when snowfall was particularly heavy or drifting was widespread. Part of the solution to this problem was found in building roads raised slightly above the level of the adjacent land, with broad, deep ditches to catch drifting snow. Snowplowing of highways was introduced during the 1930's but did not become general on local municipal roads until the consolidation of schools and the introduction of rural school buses after about 1948.

Several factors combined to bring about a rapid improvement in road transport after World War II. The war brought an abrupt end to the depression of the 1930's, a period of low prices for agricultural products, crop failure from drought in some areas, and surplus labor. During and immediately after the war the farmers of the region prospered. The resulting accumulation of capital, combined with a labor shortage, brought about rapid mechanization of agriculture. The use of horses for motive power in the field and on the road declined rapidly. The demand for improved roads increased and the prosperous state of agriculture made the necessary funds available to the municipalities. The revenues

of the provincial government increased phenomenally after 1947 when oil was discovered at Leduc, because the province owns approximately 95 per cent of the mineral rights in Alberta. The system of highways was rapidly improved and expanded. Until this period the only hard-surfaced highway in the region or in the province was the Calgary-Edmonton route. Now more than half of the highway mileage in the region is hard-surfaced. Municipal roads are generally graded and gravelled, but no hard-surfacing has been undertaken except in the towns.

Besides the problems of construction and maintenance already mentioned, certain difficulties are encountered because of the nature of the soils and surficial deposits in the region. The high organic content of the chernozemic soils in the central part of the region makes them generally unsuitable for road construction. They will not bear heavy loads, especially when wet. When graded roads were first built in the region the topsoil was mixed with the underlying materials, usually ground moraine or lacustrine materials consisting of clay with varying proportions of silt and sand and a few boulders. The roads built in this manner have reasonably good load-bearing qualities, but become sticky and impassable after the spring thaw and during rainy periods, and they dry slowly. Surfacing materials are readily available in the form of glacially deposited gravels widely dispersed throughout most of the region. These are now commonly used by the municipalities to make local roads passable all year round. Highway

construction standards have improved greatly. The usual procedure now is to use a sub-base of compacted clay, then a layer of gravel, and several layers of asphalt-gravel mix. Construction of the various layers is often spread over several years to allow for uneven settling because of the varying nature of the surficial deposits on which the roads are built.[7] The region now has an expanding network of highways able to carry the heaviest traffic.

The highway between Calgary and Edmonton carries more traffic than any other in the province, and is the only major route which passes completely through the Red Deer region. The portion south of Red Deer is a four-lane, divided highway, and the northern part is being rebuilt to the same standards. The routing of the present highway along Red Deer's main thoroughfare, Gaetz Avenue, has resulted in serious traffic congestion within the city. The new route by-passes the city about two miles west of the present one, bridging the river less than a mile from the old Red Deer Crossing, the ford used ninety years ago.

Most of the other highways in the region parallel the railways and serve the settlements which were established on the railways, though in recent years some additional connecting links have been built where there are no railways. An important exception to the general pattern of highways paral-

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[7] It should perhaps be mentioned that road construction is possible during only about six months of the year--May to October--when the surface is not frozen.

leling railways is the highway running west from Innisfail. It serves ranching and lumbering operations to the west of the Red Deer region, but it is also the main transportation route for many farming communities. The area it crosses is not served by any railway, yet it contains a number of small settlements, the earliest being Markerville and the largest Caroline (see Figure 12).

The highway west from Red Deer to Sylvan Lake and Rocky Mountain House is now regarded by the residents of Central Alberta as part of the David Thompson route to the mountains. Its present functions are to serve agricultural areas and settlements, the summer resorts at Sylvan Lake, and various oil fields. The highway was extended west of Rocky Mountain House to serve the former mines at Brazeau. This extension now is used for access to the roads within the forest reserves and by hunters and fishermen. A further westward extension up the valley of the North Saskatchewan River to the Banff-Jasper highway has existed as a trail for some time. Summer vacationers occasionally travel the route, usually by truck or four-wheel-drive vehicle. It now seems probable that a highway will be built along this route within the next few years. The major advantage of this route would be to give residents of Central Alberta direct access to the mountains and the national parks. It would not shorten the distance to the mountains for residents of Edmonton or Calgary, but would add the variety of another route. A further westward extension of the route through Howse pass into

British Columbia would similarly provide better access for Central Alberta, but there would be no appreciable saving in mileage from the rest of the province. Consequently it appears unlikely that the David Thompson route will be extended into British Columbia until there is considerably more development of the parks through which it would pass.

4. Other Forms of Transportation

The Red Deer region is not served by scheduled airline services, though a strip is available for light aircraft seven miles northwest of Red Deer and there is a military airfield at Penhold five miles south of the city (see Chapter VI). As a minor city located less than a hundred miles from major airports at Edmonton and Calgary, Red Deer cannot support regular air services. The technological and economic development of short-run air transport may, of course, change this situation in the future. The lack of air service is offset to some extent by the location of the two major airports within two hours' driving time of Red Deer.

The location of the Red Deer region has certain advantages with respect to the transmission of electric power. Though no power is produced in the region, it is traversed by two major power transmission lines which link Edmonton in the north with the hydro-electric stations of the Bow River basin to the south. Thus Red Deer and its region have access to low-cost power without having to bear the whole cost of transmission facilities.

Somewhat similar locational advantages exist with respect to pipelines carrying oil and natural gas, though the situation is more complex since the producing areas are widely scattered. As the technology of transportation by pipeline develops in the future, it may be anticipated that Red Deer will enjoy a locational advantage with respect to the movement by pipeline of such commodities as refined petroleum products and coal.

# CHAPTER V

# AGRICULTURE

## 1. Mixed Farming

The agriculture of the Red Deer region has been described as mixed farming from its very beginning[1] to the present day.[2] The term mixed farming is a nebulous one which requires definition in respect to the Red Deer region. Most broadly it signifies a lack of specialization in one land use or in one product for market, either in the region as a whole or on particular farms. More particularly it implies a mixture of field crops and livestock production, with some degree of interdependence between the two. This is the general pattern, within which some specialization occurs, both on individual farms and in particular parts of the region.

Mixed farming is to some extent a legacy of the early agricultural settlement in the region. Settlers from other parts of Canada and from other countries were unfamiliar with local conditions and tended to experiment with different types of farming in order to discover what was best adapted to the region and to avoid disastrous losses. The proverb,

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[1] Rev. Leonard Gaetz, op. cit., p. 8.

[2] Alberta Department of Industry and Development, Industrial Development Branch, Survey of Red Deer, Edmonton, 1960, p. 25.

"Don't put all your eggs in one basket", expresses the attitude which led many farmers to diversify their operations. This attitude toward farming is justified in part by the retion's climatic conditions. As noted earlier, both precipitation and the frost-free season vary greatly from year to year, and hail occurs fairly frequently. As a result field crops cannot be expected to produce a dependable income every year. Similarly, the period during which livestock can pasture varies greatly from year to year with variations in moisture supply, snow cover, and temperature. Problems such as these have been partly overcome in recent years by improved knowledge of the region acquired from experience and from scientific investigation and experimentation. For example, "trash cover farming" has been widely used to conserve moisture; early maturing varieties of grain have been developed especially for use in the region; and breeds of livestock suitable for the region have been imported and developed. While the development of agricultural practices appropriate to the region has led to some specialization, it has also emphasized a need for some diversification. For example, crop rotations include both grain and forage crops, thus strengthening the pattern of production of both field crops and livestock. Changing market conditions are of course another factor favoring the farmer who can produce a variety of products over the specialist.

Within the past fifteen years several factors have brought about some shift in emphasis from mixed farming to

specialization in one product on particular farms. The combination of relatively stable prices for farm products and rising costs for manufactured goods has been evident in Canadian agriculture since about 1951.[3] During the period agricultural production was generally rising, but domestic demand for agricultural products--domestic markets absorb about 70 per cent of Canadian production--has not risen proportionally because the demand for agricultural products is generally inelastic. At the same time prices of manufactured products have risen, and the need for greater efficiency has prompted farmers to use more manufactured products. So farmers have required increasing amounts of capital. The situation is popularly described as the "cost-price squeeze". Part of the increased capital investment on farms has been in the form of more elaborate and highly specialized equipment and buildings. Being unable to afford large capital outlays for several types of production, farmers have had to choose particular specialities.

Another factor leading to specialization is a trend toward vertical integration or contract farming in the production of certain products. Dairy production is one example. With the development of an improved system of highways and market roads and increasing urban population the production of fluid milk in the region has increased. Dairies prefer to ensure a stable supply of milk of uniform quality by negotia-

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[3] S. Sinclair, "Impact of Economic Growth on Agriculture," in The Next Decade in Canadian Agriculture, University of Alberta, Edmonton, 1960, pp. 1-9.

ting contracts with a few producers. These producers, assured of a market, are able to specialize.

A third factor emphasizing specialization is the stabilization and support of farm income by means of marketing boards and government payments of various kinds. This factor, like vertical integration or contract farming, has tended to reduce the risk involved in specialization.

2. Field Crops

The crops most commonly grown in the region are wheat, oats, and barley. There is some specialization in wheat in the eastern part of the region where the growing season is longer and precipitation less (see Table 3 and Figure 16). Wheat is generally sold as a cash crop, though some is used for livestock feed when grades are low or when a surplus leads to the imposition of delivery quotas for grain. Oats and barley are customarily grown for feeding livestock, especially hogs, within the region and for sale as cash crops. Specialization in barley is particularly noticeable in the central area. Some malting barley is produced for sale and processing outside the region, though a small portion of the malt produced is shipped back for use at the brewery in Red Deer. Oats are sometimes harvested green for livestock feed either as "greenfeed", or as silage. Grasses and legumes are widely grown for livestock feed, usually as hay but sometimes as silage. These livestock feeds are more commonly produced in the western and northwestern parts of the region where shorter

TABLE 3

PERCENTAGE OF FARM LAND IN CERTAIN CROPS--1956

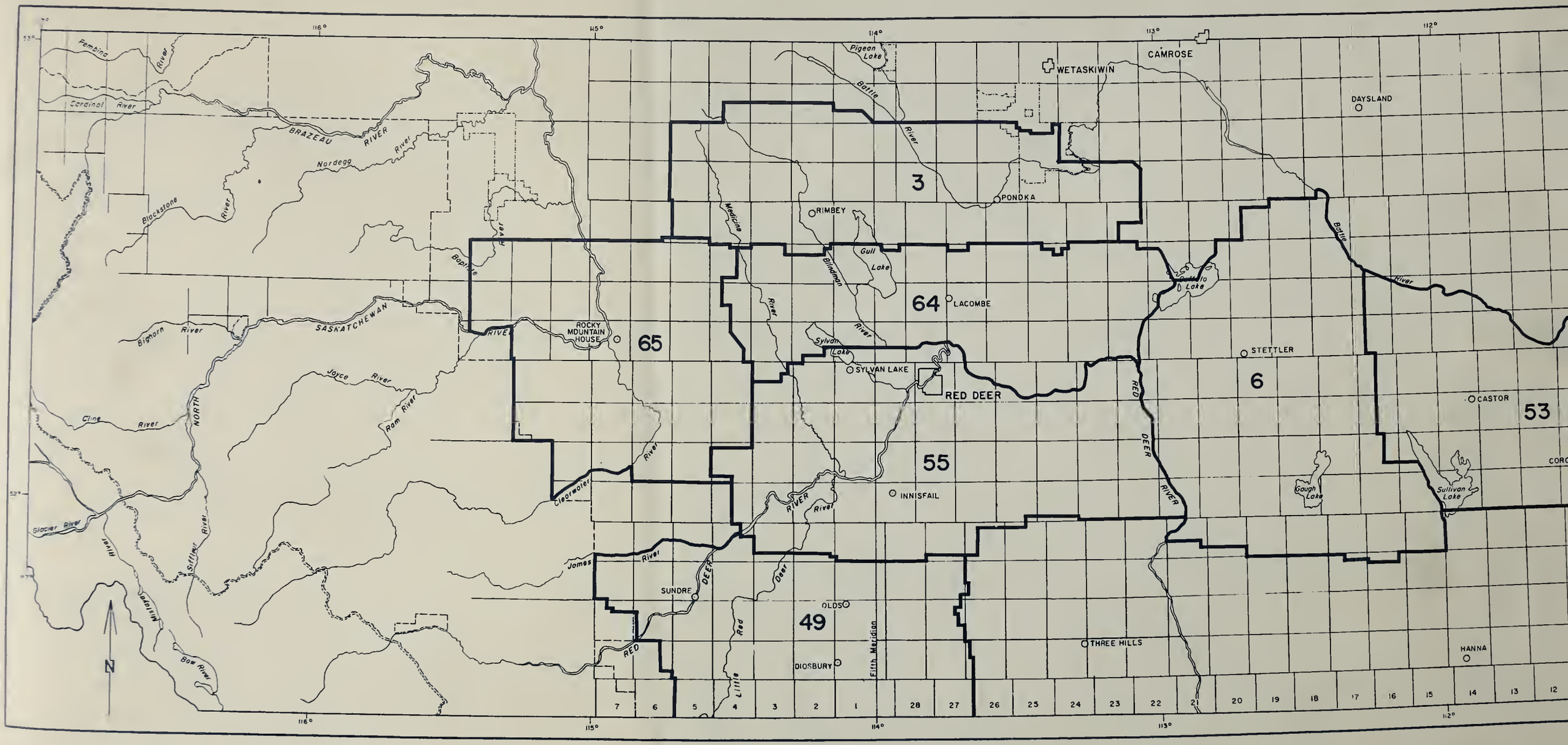
| Census Subdivision | Wheat | Oats | Barley | Rye | Flax Seed | Mixed Grains | Tame Hay | Other Fodder Crops |
|---|---|---|---|---|---|---|---|---|
| 3. Ponoka | 2.6% | 8.7% | 16.4% | 0.2% | 0.1% | 2.2% | 8.3% | 1.5% |
| 6. Stettler | 22.6 | 7.3 | 4.7 | 0.1 | 0.7 | 0.4 | 1.3 | 0.8 |
| 49. Mountain View | 4.8 | 9.6 | 16.8 | 0.2 | 0.2 | 1.1 | 7.1 | 2.9 |
| 53. Paintearth | 13.8 | 11.5 | 2.4 | 0.1 | 0.3 | 0.4 | 3.5 | 0.5 |
| 55. Red Deer | 3.2 | 7.2 | 21.4 | 0.1 | 0.1 | 0.9 | 8.5 | 2.0 |
| 64. Lacombe | 2.7 | 8.2 | 24.3 | 0.1 | 0.1 | 1.4 | 7.7 | 1.6 |
| 65. (Improvement District) | 1.0 | 6.5 | 8.8 | 0.0 | 0.0 | 0.5 | 10.1 | 0.7 |

Source: 1956 Census of Canada, Bulletin 2-9, "Agriculture--Alberta," Table 17, Dominion Bureau of Statistics, Ottawa.

growing season, higher precipitation, and grey wooded soils tend to favour their production over that of grain. Hay is occasionally sold outside the region if a shortage exists elsewhere and some is sold within the region. The common pattern, however, is for livestock feeds to be used on the farms where they are produced. Minor crops produced within the region include rye, flax seed, and rapeseed.

3. Livestock

The production of beef cattle is common in the central


116°
115°
114°
113°
112°
Fembina River
Cardinal River
BRAZEAU RIVER
Nordegg River
Blackstone River
Bighorn River
SASKATCHEWAN RIVER
Joyce River
Cline River
NORTH RAM River
Ram River
Clearwater River
Jumes River
Sullivan River
Glacier River
Bow River
Pigeon Lake
Battle River
WETASKIWIN
CAMROSE
DAYSLAND
3
PONDKA
RIMBEY
Medicine River
Gull Lake
Blindman River
64
LACOMBE
ROCKY MOUNTAIN HOUSE
65
Sylvan Lake
SYLVAN LAKE
RED DEER
RED DEER RIVER
STETTLER
6
CASTOR
53
Gough Lake
Sullivan Lake
55
INNISFAIL
SUNDRE
OLDS
49
DIOSBURY
THREE HILLS
HANNA
Little Red Deer River
Fifth Meridian
7 6 5 4 3 2 1 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12
N

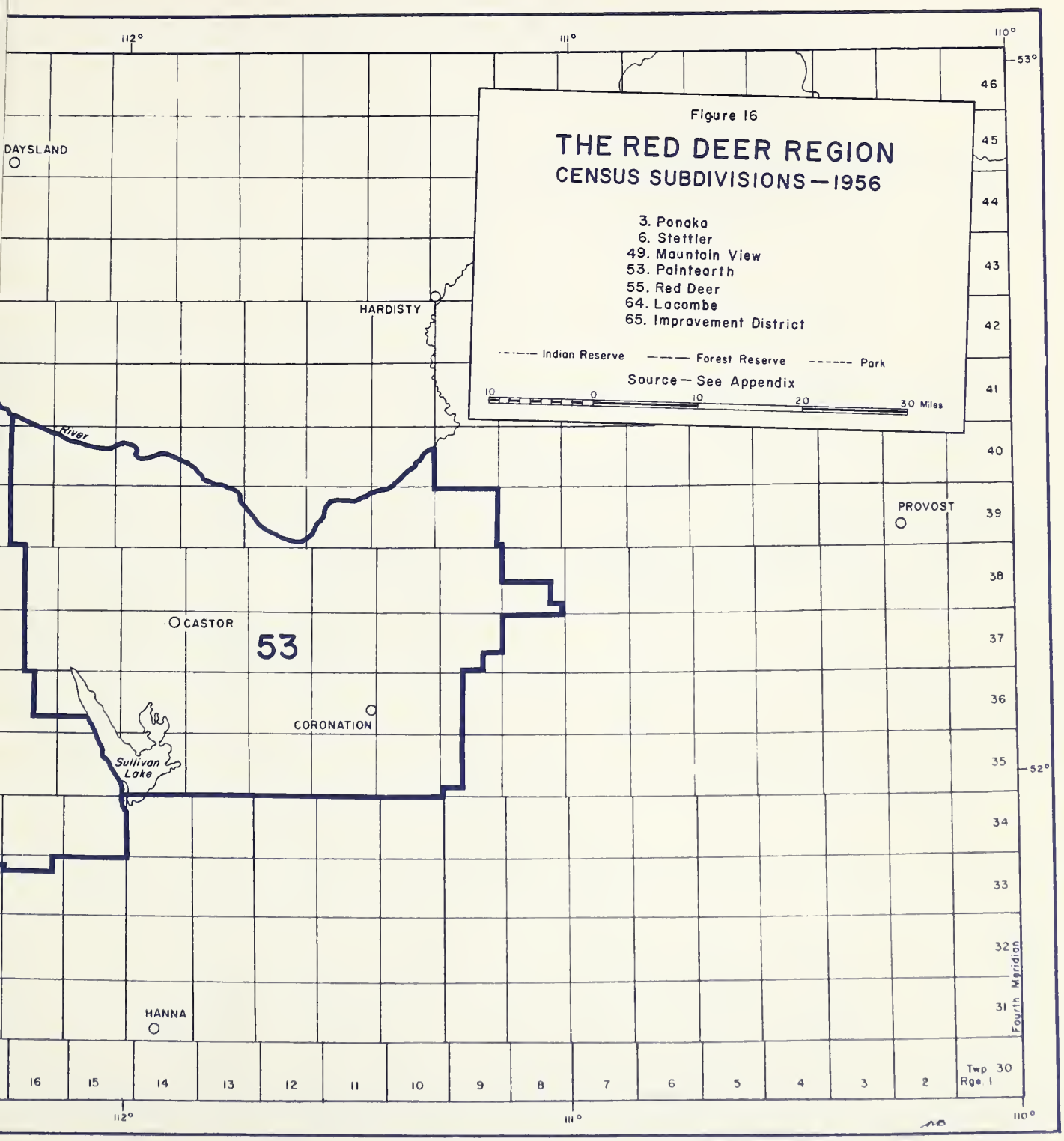


Figure 16
THE RED DEER REGION
CENSUS SUBDIVISIONS—1956
3. Ponoka
6. Stettler
49. Mountain View
53. Paintearth
55. Red Deer
64. Lacombe
65. Improvement District
Indian Reserve
Forest Reserve
Park
Source—See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
DAYSLAND
HARDISTY
PROVOST
CASTOR
53
CORONATION
Sullivan Lake
River
HANNA
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Rge 1
Fourth Meridian

and western parts of the region, generally as a part of mixed farming operations (see Table 4). Cattle are fattened on

TABLE 4

NUMBERS OF LIVESTOCK PER SQUARE MILE OF FARM LAND--1956

| Census Subdivision | Total Cattle | Milk Cows & Heifers | Sheep | Pigs | Total Hens & Chickens | Hens & Pullets |
|---|---|---|---|---|---|---|
| 3. Ponoka | 53.7 | 9.1 | 8.9 | 33.1 | 166.1 | 49.1 |
| 6. Stettler | 42.7 | 3.0 | 2.0 | 10.8 | 92.7 | 29.2 |
| 49. Mountain View | 63.6 | 6.6 | 5.4 | 26.1 | 194.0 | 52.1 |
| 53. Paintearth | 37.5 | 2.1 | 1.2 | 7.4 | 59.2 | 19.8 |
| 55. Red Deer | 58.7 | 7.8 | 4.3 | 35.1 | 172.2 | 54.8 |
| 64. Lacombe | 53.0 | 7.5 | 5.2 | 41.2 | 184.3 | 54.1 |
| 65. (Improvement District) | 41.0 | 6.8 | 8.3 | 18.1 | 117.4 | 40.5 |

Source: 1956 Census of Canada, Bulletin 2-9, "Agriculture--Alberta," Table 17, Dominion Bureau of Statistics, Ottawa.

grass or on hay and grain, according to the season. Within the past decade there has been a marked trend toward cattle feeding as a specialty in the central part of the region.[4] Some of the feed for this purpose is produced in the region and some grain is brought in from the southeast, around Three

[4] Pers. comm., R. D. Price, District Agriculturist, Red Deer, December 15, 1961.

Hills for example. While mixed farms commonly have 50 to 100 cattle, farms specializing in beef cattle feeding may have from 300 to 1,000. In many instances capital for these operations is supplied by the farmer. In some cases outside private capital is used for custom feeding operations, and in others feeder associations composed of groups of farmers receive government assistance in the form of guaranteed bank loans. Ranching is a minor specialization in the area around Pine Lake, twenty-five miles southeast of Red Deer. Here the rolling and broken physiography and varying soils of hummocky moraine make cultivation difficult. Farther east where precipitation is lower some beef cattle are raised. In particularly dry years, such as 1961, feed supplies are often insufficient to maintain herds, and cattle from the eastern area are sold for fattening in the central part of the region where more feed is available.

Sheep raising plays a minor though continuing role in the region. Despite the facts that Canada is importing lamb and the federal government is supporting the domestic price, sheep raising has not been popular. To some extent farmers have regarded sheep as suitable only for inferior land that cannot support other types of production. Other hindrances to sheep raising are the substantial losses inflicted by coyotes, and the cost of fences capable of containing sheep. Operations concentrate on the production of lambs for market, with wool being generally regarded as a by-product. Wool is marked through a producers' cooperative, the Central Alberta

Wool Growers Association.

The production of hogs for bacon has long been an important part of mixed farming in the Red Deer region and is concentrated in the central part of the region. Hogs are generally fed oats and barley produced within the region. Wheat is also used to a limited extent for feeding hogs. Skim milk is used as a feed supplement for hogs on some mixed farms where minor dairying operations are conducted for the production of cream. The importance of hog production in the region is emphasized by the development of a new breed, the "Lacombe hog", by the Dominion Experimental Station at Lacombe.

4. Dairying

Like most other forms of agricultural production in the region, dairying began as a closely integrated part of the mixed farming pattern. In most instances a few dual-purpose cattle were kept initially to supply milk and meat for domestic consumption. As creameries were established in the settlements, herds were increased and dairy breeds were introduced. The chief product was cream, fluid milk being marketed only in limited quantities to meet the needs of local settlements. Cream is taken to market both by the producers and by trucks operated by local creameries in many of the settlements of the region. The pattern of milk marketing is, however, focused on Red Deer because of the presence there of a milk condensery operated by the Central Alberta Dairy Pool. Certain farmers have agreements for the production of milk to supply

the condensery. The C. A. D. P. operates a system of twenty-two truck routes in the region to collect milk for the condensery. This stable market has led to an increasing degree of specialization in dairying on certain farms. Until 1962 milk for the condensery was transported in cans, but this system is now being replaced by bulk tank trucks.[5] Fluid milk for consumption in Red Deer is collected from a few producers within a radius of eight miles of the city by means of bulk tank trucks. Some fluid milk is now being transported by the same method to Calgary from farms as far north as Lacombe.

The extension of the Calgary milk shed so far north is the result of increasing population in Calgary, the excellent highway north from Calgary, and the physical advantages the Red Deer region has for dairying as compared with the Calgary area. These advantages are fertile soils, and precipitation high enough to produce adequate grass, hay and silage. They are lacking only in the eastern part of the region, where dairying is of minor importance (see Table 4). The region's location directly between Edmonton and Calgary makes it accessible to both of these major markets. Edmonton, however, has other good dairying areas closer at hand and hence its milk shed does not extend into the Red Deer region. A further indication of the dairying potential of the area immediately north of the region is the recent opening in Wetaskiwin of Alberta's second milk condensery. These two

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[5]Pers. comm., S. Laycraft, Field Man., C. A. D. P.

are the only ones in the Prairie Provinces.

5. Poultry and Eggs

Another longstanding feature of the region's mixed farming complex is the production of poultry and eggs. The early pattern was one of small flocks supplying domestic needs and a small surplus for local sale. Production and quality tended to fluctuate greatly with season. During the past twenty years methods of production, handling, and grading have improved. Specialized egg producers now keep flocks as large as 10,000 birds, producing eggs of uniformly high quality throughout the year. Eggs are commonly marketed through local creameries and egg grading stations in the various settlements of the region, though some of the larger producers ship directly to wholesalers outside the region.

Until about ten years ago the production of chickens for meat was generally incidental to the production of eggs. Recently, however, a few farmers on small holdings have begun to specialize in the production of broilers. Most of these operations are owned and operated by individual farmers, though the largest in the region is a corporation which produces up to 60,000 birds per year. During the same period turkey production on small holdings has become established as a minor specialty, with flocks as large as 8,000 birds. The Central Alberta Dairy Pool operates a poultry processing plant in Red Deer which serves many producers in the region.

During the early period when poultry raising was on

a haphazard basis the cold winters were a severe handicap. This problem has been overcome by the development of hatcheries in the towns, modern brooding equipment, and adequate housing. The climate of the region is now considered to be an asset for poultry raising in that the generally low humidity makes poultry less susceptible to diseases than in damper climates.

6. The Significance of Agriculture to the Region's Economy

In order to give a composite view of agriculture in the Red Deer region this section presents some material from the 1960 report of the Central Alberta Farm Business Association.[6] The Association consists of a group of sixty farmers, organized as a result of a short course in farm management held in 1958. Their farms are located within a thirty-mile radius of Red Deer. These farms cannot be considered as a representative sample, in a statistical sense, of the farms in the Red Deer region, because participation in the Association is voluntary. The farms are, however, typical in many ways of the core area of the region, and the Report gives a fair indication of the size of farms, kinds of farming, and economics of farm production in that area.

The mean size of the farms in the group is 592 acres. Capital investment per farm ranges from $24,600 to $251,000 with a mean of $62,244. This represents a mean investment of

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[6] Alberta Department of Agriculture, Farm Economics Branch, "Central Alberta Farm Business Association, 1960 Farm Management Analysis Report."

$139.38 per cultivated acre, or $41,952 per "man equivalent".[7] The relative importance of the various parts of the investment is as follows: land, 37.8 per cent; livestock, 21.7 per cent; machinery and equipment, 18.4 per cent; grain, roughage, and supplies, 11.8 per cent; buildings (excluding dwellings), 10.3 per cent. Thus this group of farms has a high capital investment per man, and land represents the largest portion of the investment.

The chief sources of revenue are, in this order: cattle, hogs, crops, and livestock products, indicating that livestock is the primary specialization of this group of farms. The operator's labour earnings are calculated to include his income from physical labour, from management, and from farm produce used in the home. Incomes calculated on this basis range from more than $11,000 to less than minus $12,000 with a mean income per operator of $2,972. Return to capital investment also shows a wide range, with a high of 12.7 per cent, a low of minus 7.0 per cent, and a mean per farm of 4.8 per cent. This is a mean return to investment of $2,778 per farm. (The minus figures for labour earnings and for return to capital investment indicate of course that some farmers are living off their capital.) The combination of labour earnings and return to capital investment generally pro-

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[7] A man equivalent is equal to one man working for a full year, and the number of man equivalents on a particular farm for a given year is the total man-months of labour divided by twelve. The man-months include the labour of the operator, his family, and hired workers.

vides a comfortable income for the farm family, though the figures suggest that this group of farmers is not especially prosperous.

The impact of farming on the economy of the region is not limited, however, to the trade generated by the expenditure of net income for consumer goods. The mean cash operating expenses per farm for 1960 are $6,078. More than half of this amount is composed of these five items: truck and tractor expenses; mill feeds, minerals, and supplements; fertilizer; machine repairs; and car expenses. These expenditures, together with consumer expenditures by the farm population, set the essential pattern of trade between the region and its settlements. It is primarily an agricultural region and its settlements are primarily agricultural service centers.

This relationship between the region and its agricultural service centers is strongest in the central area where agriculture is more intensive and there is greater specialization in livestock and livestock products, much of which is marketed and processed within the region.

# CHAPTER VI

## OTHER NON-URBAN FUNCTIONS OF THE REGION

### 1. Oil and Natural Gas

The discovery of oil at Leduc in 1947 marked the beginning of a period of greatly intensified exploration for oil and natural gas all over Alberta. The province has since become a major producer and exporter, with fields in nearly every area, including the Red Deer region. The first oil field to be discovered within the region was the Stettler field (see Figure 17), where production began in 1949. The largest field in the region and the one nearest to Red Deer is the Joffre field. Production here began in 1953 and by 1960 there were 314 producing oil wells.[1] Most production in the region, like that of the major fields at Leduc, is from Upper Devonian formations, though Mississippian and Cretaceous formations also produce some oil.

Most of the oil produced is transported by pipeline to Edmonton where it is either refined for local markets or shipped eastward via the Interprovincial Pipe Line or to the West Coast via the Trans-Mountain Pipe Line. Some very small fields do not have direct pipeline connections, and oil from them is generally trucked to the nearest pipeline. Some oil is now piped to a refinery recently opened by Canadian Oil

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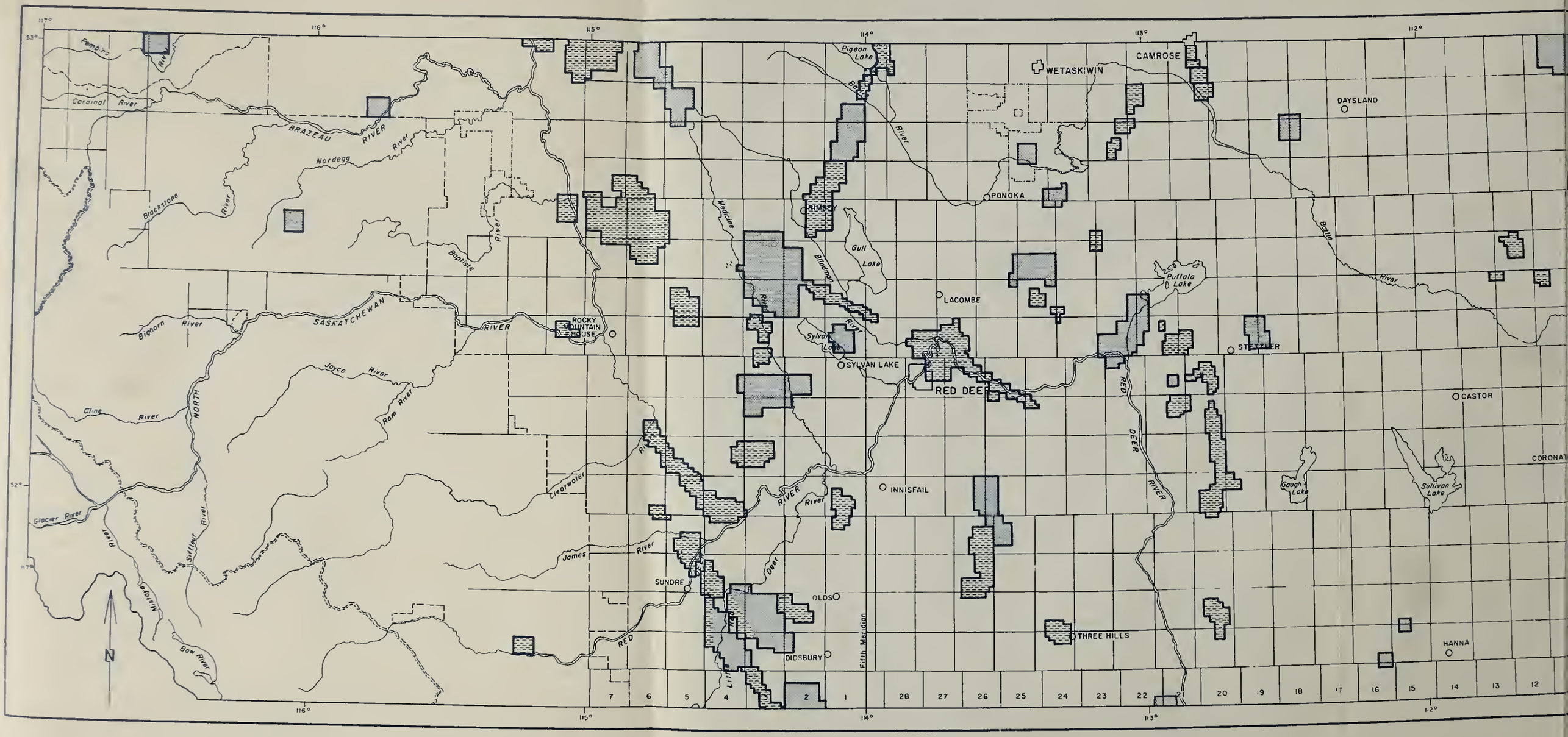
[1] Alberta Society of Petroleum Geologists, Oil Fields of Alberta, Calgary, 1960, pp. 141-143.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Pembina River
Cardinal River
BRAZEAU RIVER
Nordegg River
Blackstone River
Baptiste River
SASKATCHEWAN RIVER
Bighorn River
ROCKY MOUNTAIN HOUSE
Joyce River
Cline River
NORTH RAM RIVER
Clearwater River
Glacier River
Siffleur River
Mistaya River
James River
Bow River
SUNDRE
RED DEER RIVER
Pigeon Lake
WETASKIWIN
CAMROSE
DAYSLAND
Battle River
PONOKA
RIMBEY
Medicine River
Blindman River
Gull Lake
LACOMBE
Buffalo Lake
Battle River
Sylvan Lake
SYLVAN LAKE
STETTLER
RED DEER
CASTOR
CORONATION
Gaugh Lake
Sullivan Lake
INNISFAIL
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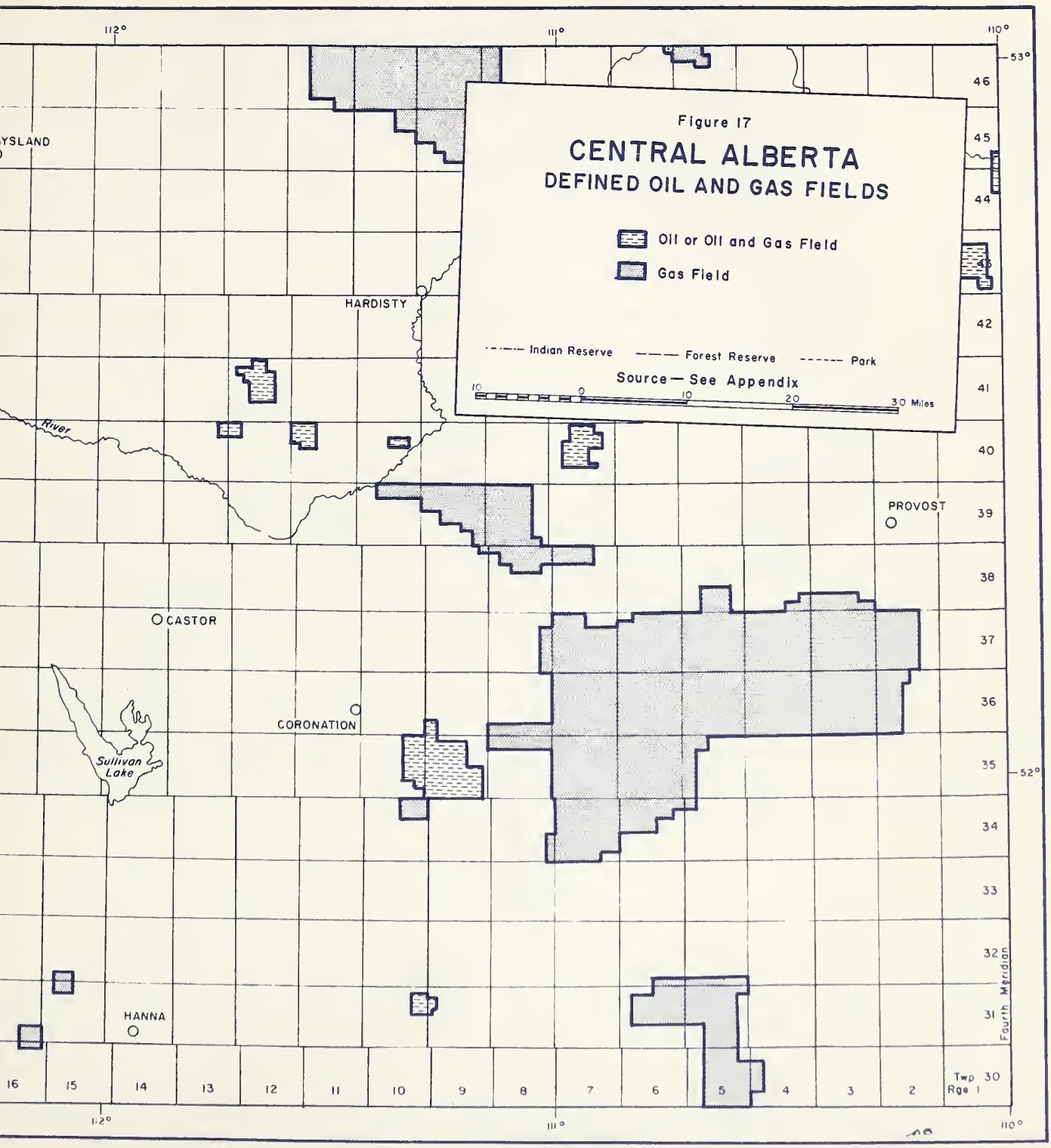
Figure 17
CENTRAL ALBERTA
DEFINED OIL AND GAS FIELDS
Oil or Oil and Gas Field
Gas Field
Indian Reserve
Forest Reserve
Park
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
HARDISTY
PROVOST
CASTOR
CORONATION
HANNA
Sullivan Lake
River
Fourth Meridian
Twp 30
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Companies Limited near Bowden to serve the Alberta market.

Natural gas production has developed along with oil production in the region. Production was rather limited until export markets were made available after 1956 by the building of the Trans-Canada Pipeline to eastern Canada and the collector system of the Alberta Gas Trunk Line. Gas from the larger fields is processed before shipping by gas plants at Rimbey and Nevis. The Nevis gas plant of the British American Oil Company is located on the north bank of the Red Deer River, about thirty miles east of Red Deer. It receives gas from the nearby Nevis field, the Stettler field to the east, and the Fenn-Big Valley field to the southeast. Gas from the latter two fields receives initial processing in two satellite plants before being piped in liquid form under high pressure to the main plant at Nevis. At the Nevis plant various by-products are removed from the gas after which it is piped to Red Deer to supply local needs, and to Edmonton and the Trans-Canada Pipeline. The by-products include propane for local use in areas not served by pipeline; butane, which is marketed as far away as Seattle and Minneapolis; natural gasoline, which is piped to Edmonton along with crude oil; and sulfur, which so far has been stored at the site of the plant, no market being available.

The discovery and production of oil and natural gas has not had as great an impact on the Red Deer region as on some other agricultural areas of Alberta, chiefly because the oil fields of the Red Deer region are smaller. For example,

the Redwater field northeast of Edmonton has about 850 producing oil wells and the Leduc-Woodbend fields have nearly 1,200 as compared with 303 in the Fenn-Big Valley fields and 314 in the Joffre field.[2] The effects of the discovery and utilization of oil and natural gas may be summarized according to three stages: exploration, development, and production.

Initial exploration in the field is usually done by parties of geophysicists using small drilling rigs and seismographs mounted on trucks. During this stage some additional employment is provided for unskilled local labour, and the local economy benefits somewhat from providing accommodation and meals for field parties. When it is decided to drill exploratory oil wells or "wildcats" the same effects are prolonged for the period of drilling. In addition local contractors may get some business from trucking, clearing trees, building roads, and levelling wellsites. A farmer on whose land a well is drilled will get several hundred or perhaps a thousand dollars compensation for "surface rights". The exploration stage is, however, a very temporary one, its effects lasting only a few months or a year at any one site.

The development stage begins when marketable quantities of oil or gas are discovered from a wildcat well. More wells are drilled in the area over a period usually lasting several years. The effects on the economy become semi-permanent. If an "oil boom" appears at all, it is during this stage.

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[2] Ibid., pp. 106-111, 150-157, 181.

Accommodation and meals are provided by new trailer camps, hotels, and restaurants. Employment of both local and outside labour increases considerably. Local contractors are able to expand operations on the basis of oil field service work. Various oil field servicing businesses establish local offices, warehouses, and service depots. Many of these firms have located in Red Deer, and a few in smaller centers such as Stettler and Rimbey. Their growth is inhibited, however, by the proximity and accessibility of Edmonton and Calgary. Farmers benefit from compensation for surface rights, and the very small percentage holding mineral rights profit greatly from the sale of leases and from royalties on production. The effects of development are not entirely beneficial. For example, the hauling of heavy oil field equipment has in some places severely damaged municipal roads which were not constructed for such use.

The production stage follows when the limits of a field are established and development drilling is completed. The landscape, which had changed dramatically with the introduction of drilling rigs and derricks, once more assumes a character that is primarily agricultural. Most of the area used for wellsites is returned to agricultural production, and pipelines are buried beneath the fields. Unproductive wells are completely sealed off and covered. This rehabilitation of the land is largely the result of strict governmental regulation. Most of the visible features which mark an area as a producing oil field are rather inconspicuous.

Wells are generally spaced at one per forty acres east of the Fifth Meridian and one per eighty acres west of it. A producing well is marked by the valves of the "Christmas tree" and sometimes a pump, the whole site occupying less than an acre. Somewhat larger sites, spaced about one per square mile, are occupied by "tank batteries", consisting of storage tanks for crude oil, equipment for separating gas and water from the oil, and "flare pits" for burning waste gas and oil. In oil fields where gas production is not great enough to warrant the construction of gas plants, the gas is continually burned, giving the landscape a striking appearance at night. Perhaps the most adverse effect on the agricultural landscape is the fragmentation of fields by access roads to producing wells.

The permanent economic effects on the region are less marked than the effects of the development stage. This is best explained by the fact that oil and gas production is one of the most highly automated industries. Producing wells usually require only a short daily visit from a "pumper", who often resides on a nearby farm, and tends a number of wells. Other routine servicing is handled by employees who usually live in local settlements. Larger facilities such as gas plants, which may involve investments of several million dollars, are also highly automated and have only a few employees. Small offices are established by the major companies in the larger settlements near oil fields, such as Red Deer and Stettler. The total employment is, however, less than during

the development stage. The long-term effects of the industry on the region are intensification and modification of existing patterns rather than the establishment of new patterns. Both highways and municipal roads are improved to meet the demands of increased traffic. A few more opportunities are available for non-agricultural employment. A few new businesses are established. Most existing businesses receive a somewhat increased volume of trade. The construction of gas processing plants represents a significant addition of industry in a region that is primarily agricultural. There are also indications that the region may become the site of a petrochemical industry, utilizing local gas and oil, and the water of the Red Deer River. Development based upon any one field must be viewed as a temporary phenomenon, because of the limited extent of the structural and stratigraphic traps in which oil and gas occur in the region. Many of these, however, undoubtedly remain to be discovered, so the petroleum industry may be expected to outlast the life of the fields now producing in the region.

2. Recreational Areas

Within the Red Deer region several summer resorts provide facilities for vacationers living in cottages, trailers, and tents, and for summer camps operated by churches and other organizations. The popular resorts are located on the region's more attractive lakes: Sylvan, Gull, Pine (twenty miles southeast of Red Deer), and Buffalo. Sylvan Lake, the

oldest and largest of these resorts, is also an agricultural service town with a permanent population of 1,300. The first cottages at Sylvan Lake were built in 1904.[3] This early start, combined with the convenient access provided by two railways and a highway, led to the development of Sylvan Lake as one of Alberta's major summer resorts. Summer vacationers come not only from Red Deer and the region, but also from Edmonton and Calgary.

The foothills and mountains to the west of the Red Deer region are particularly well suited to big game hunting. In recent years Rocky Mountain House and Ricinus, on the western margin of the region, have developed a minor function as outfitting centers for hunters. Some "dude ranches" are also located in the area. These recreational activities are fostered by an abundance of big game, upland game, and fish, and by the restrictions upon development imposed by the forest reserve. The importance of these functions may be expected to increase as roads in the area are improved.

3. Forestry

During the earlier years of settlement minor lumbering activities accompanied agricultural occupance in the central and western parts of the region. Sawmills were operated at Red Deer and Sylvan Lake. This function declined with the clearing of land for farming, both because of the depletion

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[3]Annie L. Gaetz, op. cit., p. 66.

of the forest resource, and because of changing methods of land clearing. The early method of cutting trees individually allowed the selection of larger ones for use as lumber. Since World War II, however, most clearing has been done mechanically. Complete stands of trees are felled by powerful bulldozers or "brushcutters", piled indiscriminately, and burned. Small woodlots are commonly left to provide shelter and fuel on farms, but there is little demand for fuelwood in the settlements since most are now served by natural gas.

The forested area to the west of the region is a minor source of forest products for Alberta. Some processing of the products is done within the region, including lumber milling at Rocky Mountain House and creosoting of posts and poles at a new plant four miles north of Red Deer.

4. R. C. A. F. Station Penhold

During World War II the Royal Canadian Air Force constructed several training fields in the Red Deer region, including Station Penhold five miles south of Red Deer. Following the war they were all closed. Station Penhold was later re-activated as a Commonwealth Air Training Station, and now has a permanent and temporary population totalling about 1,200. The station is thus one of the region's major employers, and contributes substantially to the economy of Red Deer.

# CHAPTER VII

## FUNCTIONS OF RED DEER

This chapter is concerned particularly with those functions of the city of Red Deer which serve the Red Deer region. These functions provide the economic base of the city; they are its raison d'être. In this respect Red Deer is a typical city rather than an unusual one. "A fundamental trait of both town and city in all ages has been that they are institutional centers (commercial, cultural, and administrative) for their surrounding territory."[1]

### 1. Media of Communication

The functional region defined by its relationship to the city of Red Deer has a framework composed of lines of transportation and communication. This framework gives the region its unity and coherence. The lines of transportation serve not only as the means of moving goods, but also as the media for the most basic kind of communication, the movement of people. This basic form of communication is complemented by other media: newspapers, telephones, radio, and television.

Red Deer and the region are served by a daily news-

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[1]Robert E. Dickinson, "The Scope and Status of Urban Geography," in Harold M. Mayer and Clyde F. Kohn, (eds.), Readings in Urban Geography, Chicago, 1959, p. 11.

paper, the Red Deer Advocate. As might be expected the circulation is highest in the city, gradually decreasing toward the margins of the region (see Figure 3). The most marked anomaly in the pattern occurs around Lacombe and northward where the circulation is much lower than it is at the same distance from Red Deer in other directions. This is primarily the result of competition from thriving weekly newspapers in Lacombe and Ponoka, and reflects a local orientation of retail trade toward these towns rather than Red Deer. A similar but less marked deformation of the pattern occurs around Innisfail. Weekly newspapers in these towns are able to compete successfully with a daily newspaper because they are, to some extent, serving the same functions. Until two years ago the Red Deer Advocate was published three times weekly. Its content was similar to that of the weekly newspapers of the region in that it reported chiefly local news of the city and region. With the change to daily publication it has retained this function, adding coverage of national and international news. It continues to compete with the region's weekly newspapers, and seeks as well to replace daily newspapers from Edmonton and Calgary which are circulated in the region. After the change the Advocate showed an initial drop in circulation, but has now recouped its losses and appears to be meeting its dual competition successfully. The fact that the newspaper has become a daily is indicative of the changing role of Red Deer in Central Alberta. The change is from a large market and service town to a regional capital.

The residents of Red Deer take seriously the fact that it is a rapidly growing city. In fact one observer has commented that Red Deer "of late has become so absorbed with its growing pains that it has lost its sense of humour".[2]

Telephone facilities in the Red Deer region are closely related to the city of Red Deer where administrative, servicing, and exchange facilities are centralized. Rural areas surrounding the city are served by the party lines of the Red Deer Mutual Telephone Company. These are connected to the Red Deer exchange and administered and serviced from an office in Red Deer.[3] Urban telephones and long distance services are provided by Alberta Government Telephones. Servicing and administration for the central section of Alberta are now done from Red Deer, and smaller exchanges are gradually being replaced by automatic facilities located in Red Deer.[4] Direct distance dialling is now available from Red Deer. Modernization and centralization has necessitated the construction in the city of a new telephone building and an increase in staff to about 120.

Central Alberta is served by radio station C K R D and television station C H C A, located in Red Deer. The television station also has two satellite transmitters located at Coronation on the eastern edge of the region, and at Banff in

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[2]Ken Liddell, Alberta Revisited, Toronto, 1960, p. 145.

[3]Pers. comm., H. J. Edwards, Red Deer.

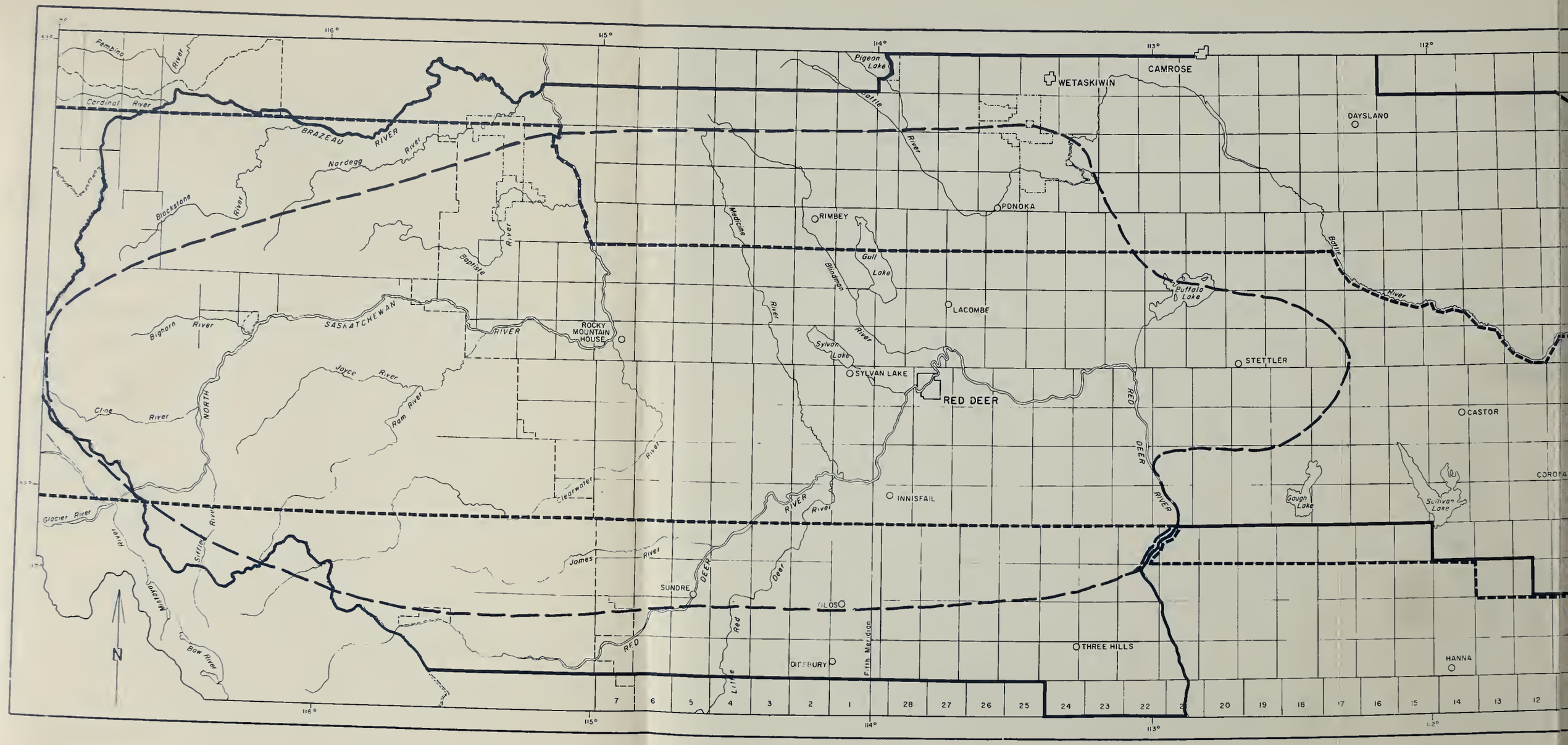
[4]Pers. comm., R. C. Glenfield, Red Deer.

the mountains to the southwest of the region.

2. Administration

Red Deer is an important administrative center for services provided by all three levels of government. At the municipal level Red Deer's administrative functions are comparable to those of the region's larger towns. The offices of the municipal district of Red Deer and the Red Deer school division (rural) are located in the city. It provides hospital and school facilities for the surrounding rural area. Some provincial government agencies in Red Deer are also comparable to those in the larger towns, for example the offices of the district agriculturist and district home economist.

Other governmental functions, however, serve much larger areas and mark Red Deer as a regional capital. Police and judiciary functions are centered in Red Deer for Central Alberta (see Figure 18). The Royal Canadian Mounted Police is responsible for policing all rural areas in Alberta as well as many towns and small cities. Three establishments are maintained in Red Deer: a City Detail for Red Deer itself, a Detachment for the surrounding areas, and a Subdivision Office for the supervision of policing in an area stretching 130 miles to the west and 150 miles to the east, but only 50 miles to the north and 40 miles to the south. The Judicial District of Red Deer shows a similar east-west elongation in a more exaggerated form. The National Employment Service also serves most of Central Alberta from Red Deer, though its im-


116°
115°
114°
113°
112°
Fembina River
Cardinal River
BRAZEAU RIVER
Nardegg River
Blackstone River
Baptiste River
Pigeon Lake
Battle River
WETASKIWIN
CAMROSE
DAYSLAND
PONOKA
RIMBEY
Medicine River
Blindman River
Gull Lake
LACOMBE
Buffalo Lake
Battle River
STETTLER
Bighorn River
SASKATCHEWAN RIVER
ROCKY MOUNTAIN HOUSE
Sylvan Lake
SYLVAN LAKE
RED DEER
RED DEER RIVER
CASTOR
Joyce River
Ram River
Cline River
NORTH RAM River
Clearwater River
INNISFAIL
Gaugh Lake
Sullivan Lake
Glacier River
Siffleur River
Job River
McLeod River
Bow River
James River
SUNDRE
DEER RIVER
Red Deer River
Little Red Deer River
OLDS
OLDSBURY
Fifth Meridian
THREE HILLS
HANNA
N
7 6 5 4 3 2 1 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12

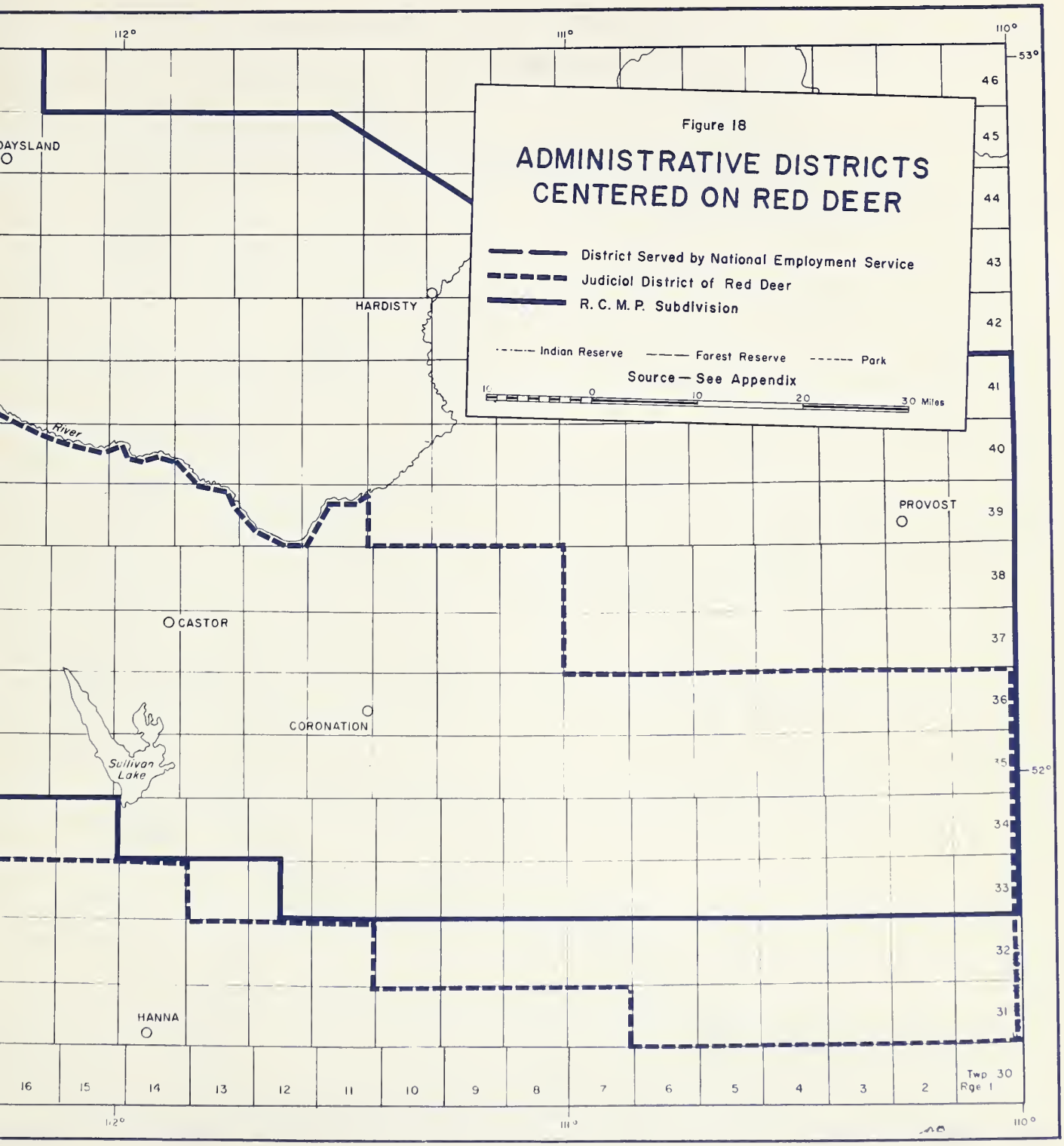


Figure 18
ADMINISTRATIVE DISTRICTS CENTERED ON RED DEER
District Served by National Employment Service
Judicial District of Red Deer
R. C. M. P. Subdivision
Indian Reserve
Forest Reserve
Park
Source — See Appendix
0 10 20 30 Miles
112°
111°
110°
53°
52°
DAYSLAND
HARDISTY
River
PROVOST
CASTOR
CORONATION
Sullivan Lake
HANNA
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
16
15
14
13
12
11
10
9
8
7
6
5
4
3
2
Twp 30
Rge 1

portance west of Rocky Mountain House is negligible because of the very low population density there. These patterns are similar to the general form of the Red Deer region as defined earlier but they cover somewhat larger areas. Because of the necessity for including all areas of Alberta in the areal division of police and judiciary functions, the patterns show arbitrary extension to the east and west into areas that are only slightly related to Red Deer by other functions.

Various other governmental functions for Central Alberta are also centralized in Red Deer. For example, the Highways Department has in Red Deer the offices, garages, and maintenance shops of its Central District. This establishment serves an area extending to the provincial boundary on the east, twenty miles into the forest reserve on the west, to Wetaskiwin on the north, and to Didsbury on the south. Governmental functions related more generally to the province as a whole include the Provincial Training School for retarded children and the Deer Home Mental Hospital for retarded adults.

3. Marketing and Processing

Red Deer and its region are perhaps more closely related by the marketing and processing of agricultural products than by any other function. A primary factor in this relationship is the location in Red Deer of the head offices and four plants of the Central Alberta Dairy Pool. This is a producer-owned cooperative which began in 1925 with a creamery at Alix, about thirty miles northeast of Red Deer. There

has been a steady expansion in the volume and variety of products as well as in the number of plants and routes servicing them. The list of products now includes butter, fluid milk and cream, ice cream, cottage cheese, condensed milk, powdered milk, eggs, powdered eggs, broilers (chickens and turkeys), and honey. The establishment of the milk condensery effectively focused operations in Red Deer, and the plants there now include facilities for all of the dairy and poultry products listed above.

The condensery at Red Deer receives milk from nearly every part of the Red Deer region. At peak seasons 250,000 pounds per day are processed. Until the recent opening of a condensery at Wetaskiwin, Red Deer's was the only one between Ontario and British Columbia. Condensed milk from Red Deer is marketed in British Columbia, Alberta, Saskatchewan, and occasionally in Manitoba. Fluid milk and other dairy products for the local market are also processed at Red Deer.

Egg grading and marketing in the Red Deer region has usually been done by local creameries, including those of the C. A. D. P. In order to handle an oversupply of low grades at certain seasons, an egg drying plant has been established at Red Deer. Another recent addition to the facilities is a poultry processing plant with a peak capacity of 700 chickens or 500 turkeys per hour. Eggs and poultry are not generally collected by trucks as are milk and cream. Hence producers have frequent occasion to make trips to Red Deer for marketing purposes. These trips undoubtedly contribute to Red Deer's

importance as a retail trade center.

The C. A. D. P. has, in addition to the plants at Red Deer, a system of creameries in the region's smaller centers (see Figure 19). Many of these are served by truck routes. Alix, besides having one of these local creameries, has retained some of its initial importance through the centralization there of butter storage facilities. This is partly the result of its having had the first plant, and partly because it is served by three railway lines and a highway. Butter from the various creameries is stored at Alix in bulk (fifty-pound boxes) in refrigerated warehouses with a total capacity of 1,500,000 pounds. As orders are received it is printed and wrapped by high-speed machinery and shipped in carload lots by rail. Most goes to the Vancouver market, though smaller quantities are shipped to southern Alberta.

The C. A. D. P. also has creameries and dairies to the south of the region at Acme, Brooks, Calgary, Hanna, and Lethbridge. It also operates a honey processing plant at Bassano in southeastern Alberta. Some honey goes to this plant from the Red Deer region, but most is produced in the irrigated areas around Bassano. These plants are significant to Red Deer chiefly because the head office of the C. A. D. P. is located there.

Livestock raised in the Red Deer region are marketed in a number of ways. Before the advent of good roads and highways, livestock were generally taken from farms to the nearest railway and shipped by rail to Edmonton and Calgary where

116°
115°
114°
113°
112°
Fembina River
Crowsnest River
BRAZEAU RIVER
Nordegg River
Blackstone River
Baptiste River
SASKATCHEWAN RIVER
Bighorn River
Cline River
NORTH RAM RIVER
Joyce River
Clearwater River
Glacier River
SOUTH SASKATCHEWAN RIVER
Bow River
James River
ROCKY MOUNTAIN HOUSE
Pigeon Lake
Battle River
WETASKIWIN
CAMROSE
DAYSLAND
Bluffton
PONOKA
RIMBEY
Medicine River
Gull Lake
Blindman River
Bentley
LACOMBE
Buffalo Lake
Battle River
Alix
STETTLER
Eckville
Sylvan Lake
SYLVAN LAKE
RED DEER
RED DEER RIVER
Delburne
CASTOR
INNISFAIL
Elnora
Gough Lake
Sullivan Lake
SUNORE
DEER RIVER
Red Deer River
OLDS
Little Fifth Meridian
OIDBURY
THREE HILLS
HANNA
CORONATION
7 6 5 4 3 2 1 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12
N

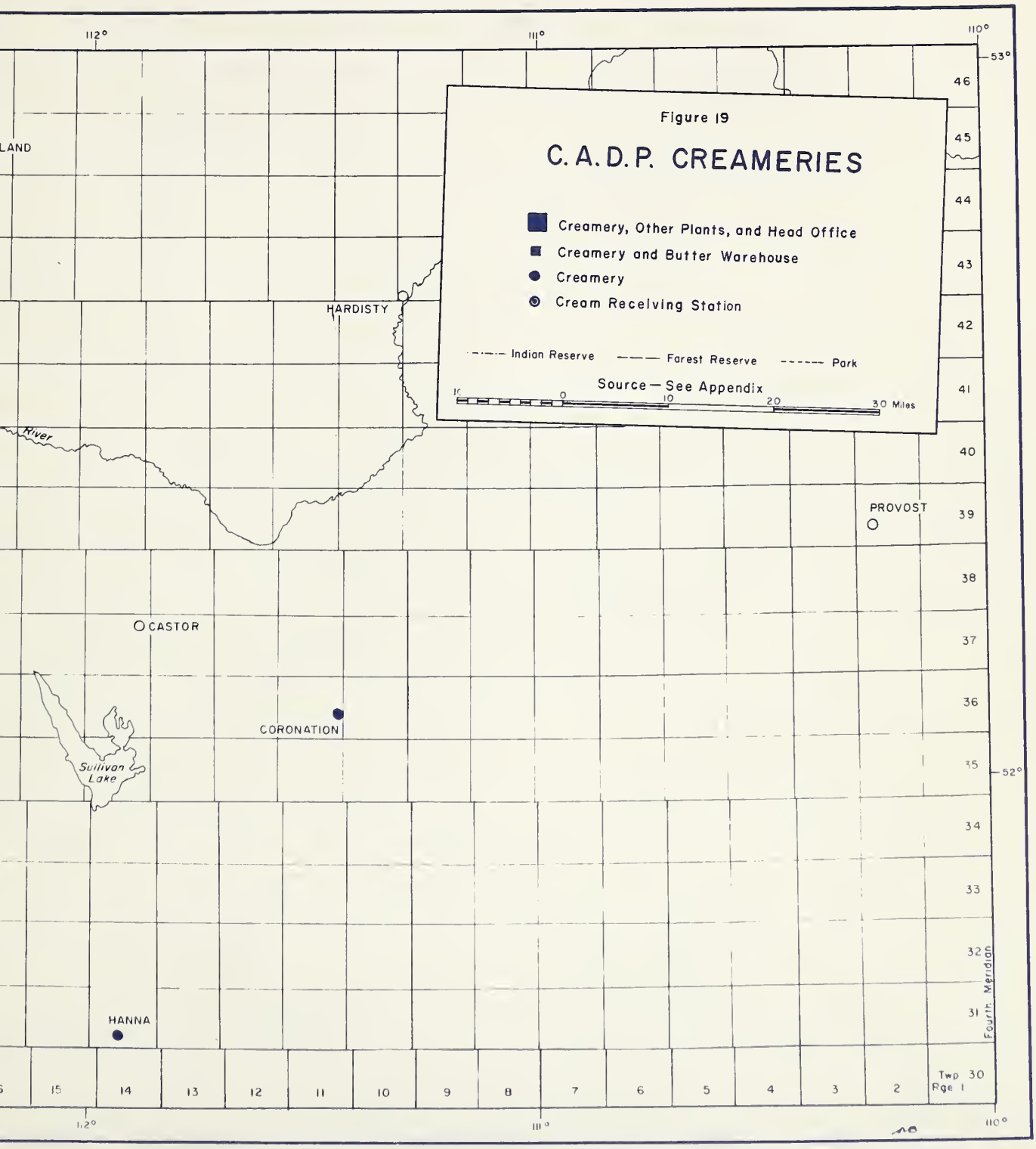


Figure 19
C. A. D. P. CREAMERIES
Creamery, Other Plants, and Head Office
Creamery and Butter Warehouse
Creamery
Cream Receiving Station
Indian Reserve
Forest Reserve
Park
Source — See Appendix
10 0 10 20 30 Miles
112°
111°
110°
53°
52°
HARDISTY
PROVOST
CASTOR
CORONATION
HANNA
Sullivan Lake
River
Fourth Meridian
Twp 30
Rge 1

Alberta's main meat packing plants are located. As road facilities have improved, more and more shipments have been taken by truck directly from farms to the Edmonton and Calgary markets. The only livestock slaughtered locally have been those required to meet part of the local needs for fresh meat.

A reorientation of the livestock marketing pattern began in the spring of 1962 with the opening of a packing plant in Red Deer.[5] Red Deer Packers Ltd. is a local company financed by local capital under the direction of General Manager Alec Sim. The initial slaughtering and dressing capacity of the plant is 35 cattle or 200 hogs per hour, with provision for doubling this capacity by the addition of more equipment. About forty-five people are employed. This development is a result both of increased livestock production in the region and of Red Deer's growing importance as a regional center.

Another significant feature of livestock marketing is intra-regional trade in unfinished livestock. Cattle and hogs not yet ready for market are sold to farmers who specialize in fattening them for market. Much of this trade is carried on at auction marts located in Ponoka, Lacombe, Stettler, Innisfail, and Red Deer. The largest of these is Sim's Action Mart in Red Deer, with four auctioneers, including Alec Sim, the manager of the packing plant. Auction sales are held several days per week. In addition to livestock, farm equipment and household goods are sold.

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[5] The Red Deer Advocate, March 8, 1962.

These auction sales have social as well as economic significance. They are similar in many ways to farm auction sales held on farms to sell the livestock, equipment, and household goods of farmers who are retiring. These farm sales are important community events, attended not only for the purpose of buying but also to visit with neighbours, to find out what prices are, and generally to see what is going on in the community. Much of this character has been transferred to the regular sales of the auction mart. Thus they tend to attract many farmers and their families to Red Deer on sale days. One trip is made to serve several purposes, with the result that retail trade in household and farm goods is centralized in Red Deer.

Increased livestock production and scientific methods of feeding have created a demand for processed livestock feeds. This demand is met by feed mills, often combined with seed cleaning mills, located in the region's larger centers. Red Deer has two such mills, the larger one being the Red Deer Seed Company Ltd. This company's feed mill has a capacity of 230 tons per day which is being increased to 400 tons per day.[6] In the three and one-half years the mill has been operating annual volume has grown to 670,000 bushels. Feed concentrates are brought by truck from Calgary and mixed at the mill with ground grains purchased in the Red Deer region. Much of the grain processed by the mill comes from the farms

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[6]Pers. comm., A. Hewlett, Red Deer.

using the feed or from nearby farms. About 80 per cent of the feed is used within a fifty-mile radius of Red Deer. Some mixed feed is also supplied to farms south of the region in order to provide loads for trucks going to Calgary to pick up concentrates.

The seed cleaning plant of this company has been in operation for eleven years. Its capacity is 1,500 bushels per hour. Some of the seed processed is produced within the region, but much of it comes from other areas. For example, rapeseed is received from as far away as Calgary, Westlock (forty miles north of Edmonton) and central Saskatchewan. The mill supplies both local and export markets. Seed is shipped by rail to Vancouver, and thence by sea to Japan, France, and Germany. Recent drops in European seed prices have resulted in the company shifting its emphasis from seed to feed. The seed mill, unlike the feed mill, is not closely related to the Red Deer region. Its location in Red Deer may be called accidental or arbitrary. Because of the structure of the Crowsnest Freight Rates, any other location between Edmonton and Calgary would provide equally favorable freight costs.

4. Distribution

Red Deer serves as a distributional center at the retail level for consumer goods and for manufactured products used by agriculture. In addition it distributes both of these classes of products as well as some others at the whole-

sale level. Some wholesalers serve only the Red Deer region, while a few distribute to larger areas. These various distributional functions are considered here under three headings: retailing, intra-regional wholesaling, and extra-regional wholesaling.

As a retail service center Red Deer is in some ways comparable to the smaller agricultural service towns of Central Alberta. It is the normal shopping center for farmers in the immediately surrounding area, its primary trade area.[7] The delimitation of retail trade areas is not included in this study, largely because it requires a detailed form of analysis which is a study in itself. It is probable, however, that the boundary of Red Deer's primary trade area lies just within the forty per cent isopleth of households receiving the Red Deer Advocate (see Figure 3). This view is based on the assumption that newspaper circulation is a significant indicator of retail trade, and the fact that the line encompasses no rival service centers except Sylvan Lake.

Retail distribution from Red Deer is of course not limited to this primary area, but extends outward to a secondary trade area within which a smaller percentage of people make all or part of their retail purchases in Red Deer. Estimates of the extent of this area vary, either because precise criteria have not been used or because criteria differ.

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[7] Primary trade area is taken to mean the area within which more than half of the residents make their day to day retail purchases in Red Deer.

A typical estimate is that the trading area extends north 50 miles, south 50 miles, east 100 miles, and west 60 miles.[8] This would give a boundary encompassing the maximum limits of the Red Deer region as defined. The retail functions of Red Deer may be of marginal importance at the extremities of the region. The view that these marginal areas have some significance for Red Deer is supported, however, by the fact that Eaton's Store makes deliveries as far away as Wetaskiwin, Olds, Coronation, and Rocky Mountain House.[9]

Shoppers from this broad area are enabled to come to Red Deer by the convenient network of highways focusing on the city. Shopping advantages over the other centers of the region include a greater variety of goods and services, superior quality in some cases, and the opportunity to compare similar products in several stores. Red Deer's ascendancy as a retail center is indicated by the presence there of the region's only branches of two major department stores, the T. Eaton Company and the Hudson's Bay Company. Eaton's has been in Red Deer since the 1930's when it took over a store that had been locally owned. The opening of the H. B. C. store about two years ago followed a market research survey of Central Alberta. The large department stores offer most of the goods available in their Calgary or Edmonton branches, but their retailing techniques differ from those of the large

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[8] Alberta Department of Industry and Development, op. cit., p. 26.

[9] Pers. comm., Mr. A. Bennett, Manager, T. Eaton Co., Red Deer.

cities because the pace in Red Deer tends to be slower, that of a farming community rather than a metropolitan center. As one observer puts it, "Red Deer is quite underdeveloped from a retail point of view in comparison to a retail-conscious public."[10] To a limited extent this slower pace attracts shoppers who prefer to avoid the traffic of Calgary or Edmonton, even though the larger centers may be as close.

The shopping advantages of Red Deer over the region's smaller centers tend to produce a "multiplier effect" on the city's retail trade. That is, people who come for one special item available only in Red Deer usually purchase other items which would be available to them closer to home. For example, children's shoes, not in themselves a major item of trade, are more readily available in Red Deer. The need for various professional services also brings to Red Deer shoppers who make other purchases at the same time. For example, Red Deer has eight dentists while no other center in the region has more than two. The same kind of dual- or multi-purpose shopping trip often occurs when farm implements or repair parts are needed. Red Deer has dealers handling all of the major brands of equipment as well as various specialized items.

Intra-regional wholesale distribution from Red Deer has been well established for many years. The city's position midway between Calgary and Edmonton and between the provincial boundaries on the east and west made it a logical choice

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[10] Pers. comm., Mr. Gathercole, Hudson's Bay Co., Red Deer.

for the distribution of wholesale groceries to Central Alberta. The area served by wholesale grocers from Red Deer is strongly incluence by transportation routes and by distance from alternative sources (see Figure 3). The pattern shows a marked eastward extension along a major highway and rail route into an area distant from other wholesalers in Edmonton and Calgary. The northern and southern boundaries are closer to Red Deer than to Edmonton and Calgary, indicating that the larger cities have an advantage in wholesaling where distances are about equal. Red Deer is a regional wholesaling center not only for groceries, but also for a variety of other products including automotive supplies, building supplies, electrical supplies, hardware, and welding supplies.

Supplying the goods and services required by the oil and gas industry constitutes a recent addition to Red Deer's functions. Red Deer now has offices, warehouse, or shops operated by most of the well-known firms, such as Halliburton, Magcobar, and Schlumberger, as well as many smaller ones. This is a regional wholesaling and servicing function resulting directly from Red Deer's central location and its good transportation facilities.

Extra-regional distribution is a function which has appeared in Red Deer only since World War II. As yet it is limited almost entirely to three firms handling farm machinery, automotive parts, and beer. The distributional areas of the three firms coincide to a high degree, and include the whole province, with some extensions to the west and north

(see Figure 20).

Nance Company is a "short line" distributor handling the products of twenty-five to thirty manufacturers of specialized or low-volume farm machinery and parts. These are distributed to retail dealers in all of Alberta as far north as Fort Vermilion, the present northern limit of farming, and in the Peace River block of British Columbia.[11] About three-quarters of the volume is brought from factories to Red Deer by truck, the remainder by rail. Virtually all shipments going out from Red Deer are made by road. Red Deer was chosen in 1946 as a distributional point for Alberta because of its central location in respect to the farming areas of the province.

The Chrysler Corporation in 1954 established in Red Deer one of its six Canadian wholesale parts depots. The others are located in Moncton, Montreal, Toronto, Regina, and Vancouver. This depot supplies repair parts and accessories to retail dealers in all of Alberta, and in British Columbia as far as Creston in the southwest and Fort St. John in the northwest.[12] The administration of the company's vehicle sales for this area is also centralized in Red Deer. Almost all shipments are brought in by road, usually as full trailer loads. Distribution from Red Deer is by truck, rail, or bus, with occasional shipments to distant points

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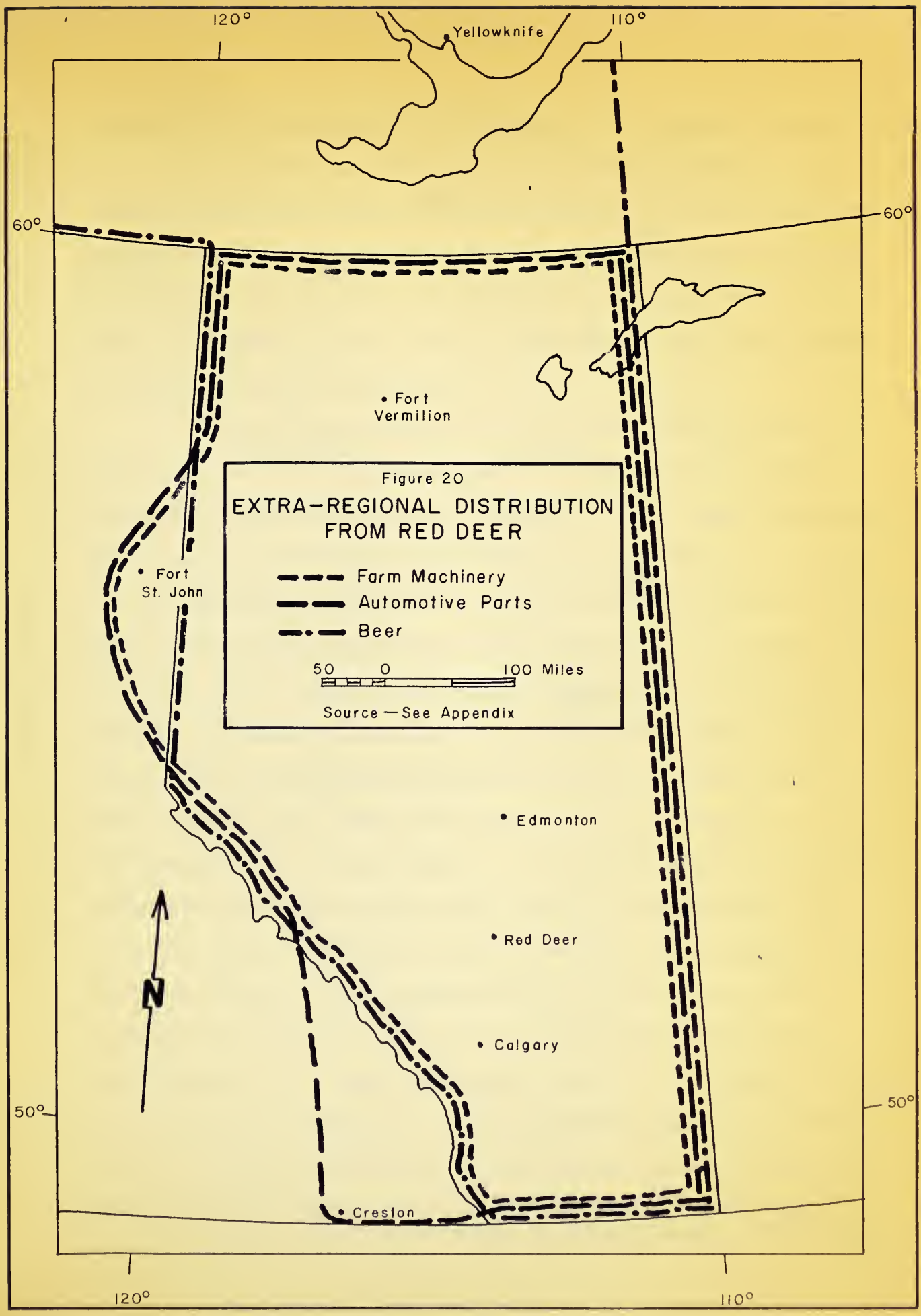
[11] Pers. comm., Mr. P. M. Woloshyn, Nance Co., Red Deer.

[12] Pers. comm., Mr. H. Whitell, Chrysler Corp., Red Deer.


120°
110°
Yellowknife
60°
60°
• Fort
Vermilion
Figure 20
EXTRA-REGIONAL DISTRIBUTION
FROM RED DEER
Farm Machinery
Automotive Parts
Beer
50 0 100 Miles
Source — See Appendix
• Fort
St. John
• Edmonton
• Red Deer
• Calgary
N
50°
50°
• Creston
120°
110°

going by air from Edmonton or Calgary. The primary reason given for choosing Red Deer was its central location. The highly competitive nature of the automotive business requires rapid distribution of repair parts. Alberta's major markets in Edmonton and Calgary are only two hours' drive from Red Deer. Shipments by bus from Red Deer reach most other parts of Alberta in less than a day.

Carling Breweries Ltd. of Red Deer produces and distributes beer for Alberta and part of the Northwest Territories.[12] Beer was generally shipped by road until September, 1961, when a new freight rate agreement resulted in a change to rail shipment. Red Deer's position is equally good for either road or rail transport. The location of the brewery in Red Deer is not, however, a clear result of the city's centrality, as with the two previously mentioned firms. The company which originally proposed building a brewery in Red Deer did not put a plant into production. In order to save the enterprise a local company, the Red Deer Brewing Company, was formed and production began in 1953. The brewery was later purchased by Western Canada Breweries, which makes the Carlings brands. This company would probably have located in Edmonton, had the brewery not already been built in Red Deer. Much of the malting barley which provides the brewery's source of malt is grown in the Peace River country, so there is not a close relationship to the Red Deer region's agricul-

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[12]Pers. comm., Mr. Locke, Carling Breweries, Red Deer.

ture.

Red Deer's function as an extra-regional distributor is firmly established, but still at an early stage of development. The city's advantages for this function are: service by both major railways, good highway access, and a size large enough to provide a labour supply and some of the amenities of city life. The importance of rail transport may decline, but both the C. P. R. and the C. N. R. are firmly enough established in Red Deer that no serious cut in service may be expected. The four-lane divided highway between Red Deer and Calgary is now the best in Alberta, and the route to Edmonton is being rebuilt to the same standards. Red Deer's rapid growth will make it a more attractive location for large firms, though it cannot hope to compete with Calgary and Edmonton in size. Many firms will continue to prefer the larger cities because they provide a greater variety of services. For example, the lack of airline service handicaps Red Deer to some extent. This lack could be largely overcome in respect to air freight and express by the provision of direct truck transfer service between Red Deer and the airports at Calgary and Edmonton. This would cut Red Deer's disadvantage in transportation time for air shipments to about one and one-half hours.

It is difficult to answer the question whether Red Deer has a locational advantage for extra-regional distribution. The representatives of Nance and Chrysler who were

interviewed both gave centrality of location as the primary factor leading to their choice of Red. Deer. However, studies such as that of Donald Kerr and Jacob Spelt[13] suggest that it is more expensive to distribute manufactured goods from a small center located half-way between two major centers than from one of the major centers. This conclusion was based on a comparison of theoretical transportation costs by truck between Toronto and Montreal, with Kingston as the half-way point. In order to determine whether the same conclusion applies to Calgary, Edmonton, and Red Deer, it would be necessary to make a detailed study of actual transportation costs and methods, and of other factors such as transportation time and labour costs.

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[13]Donald Kerr and Jacob Spelt, "Some Aspects of Industrial Location in Southern Ontario," The Canadian Geographer, No. 15, 1960, pp. 16-17.

# CHAPTER VIII

# CONCLUSION

## A. Synopsis

One of the values of regional geography is commonly held to be that it gives a comprehensive or integrated view of a particular part of the earth's surface. Because of the great number and complexity of the phenomena with which geography is concerned, such a comprehensive view cannot possibly include everything observed in a region. This synopsis therefore consists of a limited selection of the region's characteristics which together describe the region as a coherent entity. The chief criterion of selection is relationship between city and region.

### 1. Nature of the Red Deer Region

The region tributary to the city of Red Deer is a plains region modified by a kind of ridge-and-valley system. The ridges and valleys which form the basic structure of the landscape result primarily from long continued stream erosion of sedimentary rock of varying hardness. The relief of these forms has been greatly modified by glaciation, the ridges being lowered and rounded and the valleys partially filled. The region lies between flatter plains to the northeast and foothills to the southwest. Minor features of the relief vary considerably, and are the results of glacial and glaciofluvial deposition and recent stream erosion.

The climate of the region is markedly continental, with greater extremes of temperature in the east than in the west. Most precipitation originates in cyclonic storms moving eastward, and there is a gradual decrease in precipitation from west to east. In the central part of the region, immediately surrounding Red Deer, the climate is moist subhumid, microthermal, with a moderate summer water deficiency. Here climatic conditions are most favorable to agriculture. To the east there is a greater water deficiency, and to the west the growing season is shorter.

The natural vegetation is aspen parkland in the eastern half of the region and mixed forest in the western half. An observer moving northeast from Hanna to Red Deer, then west to Rocky Mountain House, and thence southwest to the mountains would note a very gradual transition from grassland to parkland to mixed forest to coniferous forest. To the south of the region the zones of parkland and mixed forest are narrower; to the north they are much broader. The transitional vegetation of the region's core was considered by settlers to be favorable to mixed farming. Forest cover was not heavy enough to make clearing excessively difficult, and provided a ready source of fuel, posts, and lumber.

The characteristic soils of the region are the black soils of the chernozemic order which occupy a major area centered on Red Deer. Brown chernozemic soils of lower organic content occur on the southeastern margin. Grey wooded soils of the podzolic order, with low fertility because of leaching,

occur on the western and northwestern margins. The zone of black soils extends to the north of the region and in a narrow belt to the south. Great local variation in soils is found as a result of differences in parent materials and drainage conditions, owing chiefly to the effects of glaciation. The predominance of fertile black soils is a primary factor accounting for the early and stable establishment of agriculture in the central part of the region.

The distribution and density of population clearly reflects the importance of the region's agricultural resources. A population density greater than five persons per square mile generally corresponds with the black soil zone (see Figures 7 and 14). The effect is reinforced by climatic factors. Mixed farming is the characteristic type of agriculture, though there is a recent trend toward specialization in livestock and livestock products, especially in the area around Red Deer. Oil and gas production is the only other economic activity of much significance to the region. Because the producing fields are relatively small and scattered throughout the region and because this activity has been superimposed upon a pattern of stable agricultural occupance, the effect has been to reinforce existing patterns of settlement and economic activity rather than to create new ones. The region remains an agricultural one.

2. Relationships between City and Region

Red Deer originated as a "half-way house" on the Cal-

gary-Edmonton Trail, Alberta's most important transportation route. The mid-point of the route happens to be a place where the Red Deer River is easily crossed. The Calgary-Edmonton Trail, in addition to following a direct line between the two major cities, follows the gap of the pre-glacial Red Deer valley through the region, and is closely aligned with the western boundary of the aspen parkland where forest cover offered little hindrance to movement. Beside these locational advantages, Red Deer enjoys a good site with ample room for expansion both on the floor of the present valley and on the gentle slopes of the pre-glacial valley. These advantages of location and site, combined with Red Deer's centrality in an area of good agricultural resources, have contributed to its development as a regional capital.

Transportation facilities are the key factor relating Red Deer to its region. Good rail routes to the east, west, north, and south enabled the city to become a distributional point for Central Alberta when rail transport was more important than road transport. The rapid improvement in road facilities and growth of road transport since World War II have reinforced Red Deer's position as a distributional center. In addition, the city's relationship to its region has been greatly strengthened by the expansion of retail, marketing, and administrative functions as a result of the improvement and increased use of the road network.

3. Recent Growth of the City

Since World War II Red Deer's population has grown at a consistently high rate, a fact which distinguishes the city from all others in Alberta. The growth of Red Deer's population during this period, in comparison with that of the agricultural service towns of the region, indicates that Red Deer is moving to a higher position in the central-place hierarchy of Alberta. It is rapidly approaching the size of such larger centers as Lethbridge and Medicine Hat[1], which occupy places second only to Edmonton and Calgary, the province's largest cities.

The reasons for Red Deer's rapid growth and its move up the central-place hierarchy are found primarily in its functional relationships with the surrounding region. Population growth has been accompanied by the addition of some new functions and by the strengthening and centralization of others. One of the new functions is the distribution of manufactured products to the whole province and adjoining parts of British Columbia, but this function has so far played a minor role in the city's growth. New additions of greater importance are region-serving functions such as the marketing and processing of agricultural products, especially livestock and livestock products, and, to a lesser extent, functions related to the oil and gas industry.

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[1]It should be noted, however, that similarity of size does not necessarily indicate similarity of function. Medicine Hat, for example, has more diversified functions than Red Deer.

The process by which existing functions have been strengthened and centralized is largely dependent upon the increased use of road transport and the improvement of the region's network of highways and roads. Administrative functions, particularly those of government agencies, tend to centralize in Red Deer. The centralization of agricultural marketing in Red Deer has brought with it increased retail trade in consumer goods and farm supplies for the region. Easy road access has allowed the extension and intensification of these functions. At the same time this growing market, combined with that of the city itself, has led to the diversification and improvement of the city's retail and service functions. The overall effect of these changes is the establishment of Red Deer as the regional capital for most of Central Alberta.

Red Deer's future as a regional capital is secure because of its centrality in a region of good agricultural resources. The city may also have an important future role as a distributional center for the whole province for a limited number of products. More detailed study is required to determine what factors account for the development of Red Deer as an extra-regional distributional center, and whether this function may be expected to expand in the future.

## B. Evaluation

An evaluation of the significance of this study and of the concepts and methods employed is required by an implicit aim of the study, namely to gain understanding of the ob-

jectives and methods of regional geography. Underlying this implicit aim is the assumption that regional geography is applicable to any area of the earth. It is not assumed, however, that the same method is applicable to all areas. Also, the objectives of regional study may vary. Thus no universal system or hierarchy of regions is implied, although the same method may be applicable to many areas.

1. Aims of Regional Geography

The first critical question which must be asked in regard to a regional study is "study for what?". It is to be hoped that the answer is not merely "study for a master's degree" or "study which can be published". A more acceptable answer, though not necessarily a clearly defined one, is "study as a contribution to knowledge". This answer assumes that the results of a study will be available to other geographers or non-geographers. This aim is educational in the broadest sense.

If regional geography is to be educational, the first question then becomes "study for whom?". There are three groups for whom the results of a regional study such as this may have educational value. The first group may be called, for want of a better term, the general public. Geography, and particularly regional geography, has a valid and long-recognized function to perform in satisfying people's curiosity about the earth. Any dismissal of regional geography as "mere description" ignores this function. The second group for whom re-

gional geography has educational value includes those who are studying the earth within the framework of a formal educational system in schools and universities. Regional study provides the basis for a knowledge of the parts of the earth which the student is unable to study in the field, and an interpretation of those regions which he is able to visit. Regional geography has also an important educational role in providing background knowledge for professional geographers who wish to study in detail some particular aspects of a region. This role would be significant if, as is often suggested, a team of geographers should study various aspects of one region by different systematic methods. A regional study, in order to make the most effective contribution to knowledge, should state at the outset for which of these groups it is intended. The present study, while it may have some value for each of the three groups, would have been more effective had it been clearly oriented to one of them.

As suggested in Chapter I, regional geography has some practical significance for city and regional planning. The relationship between city and region is particularly significant in an agricultural region such as that surrounding Red Deer. Much of the city's growth is in response to the needs of the region. An understanding of these needs helps to clarify the planning problem of the extent and character of the city's future growth. It must be repeated, however, that a regional study will have direct value for planning only insofar as the aims of the study are defined in terms of planning

principles. For example, the present study indicates in only a very general way the extent to which Red Deer's functions serve its region. More specific criteria would be required in order to estimate quantitatively the probable future growth of the city as a result of region-serving functions.

2. Delimitation of the Region

It has been assumed from the outset of this study that the delimitation of a region is only a step in regional geography, not an end in itself.[2] Having chosen the area around Red Deer for a regional study, it was necessary to select criteria by which a region for study could be clearly delimited. Regional studies of Canada have generally included this part of Alberta within a larger region, not distinguishing separate regions on a scale large enough for detailed study. Griffith Taylor, for example, includes all of the southern half of Alberta and of Saskatchewan in his "Natural Region 6: The Western Prarie".[3] Using a somewhat more detailed division, Putnam includes an L-shaped area extending east and south from Edmonton in his "Central Alberta or the Edmonton Region".[4] The commonly adopted concept of the "geographic region" involves a high degree of dependence upon easily discernible boundaries composed of physical features or forms of human oc-

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[2]Richard Hartshorne, op. cit., p. 142.

[3]E. Griffith Taylor, Canada, London, 1957, pp. 159-166.

[4]Donald F. Putnam, ed., Canadian Regions, Toronto, 1957, pp. 391, 406-410.

cupance or a combination of the two. Since few such boundaries are apparent in Central Alberta, this concept did not provide a means of delimiting a region at the desired scale.

The concept of a functional region, defined with respect to Red Deer, was suggested by Red Deer's predominance among the settlements of Central Alberta. Preliminary examination of Red Deer's "zone of influence" showed reasonable correspondence for the areas delimited according to three representative criteria: newspaper distribution, wholesale grocery distribution, and marketing of milk at the condensery in Red Deer. The area of correspondence was then defined as the Red Deer region in accordance with the stated definition of region as "an area of specific location which is in some way distinctive from other areas and which extends as far as that distinction extends".[5] The region thus delimited is a useful one for the purposes of this study, though other regional divisions of the same area are of course possible.

### 3. Validity of the Regional Concept and Method

The dilemma of the regional geographer consists on the one hand of the desire to observe and interpret as an integral unit the earth's surface or a part of it, and on the other hand phenomena which are both too numerous to catalogue and classify and too complex to explain fully. The solution--sometimes satisfactory, sometimes not--is to select for atten-

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[5]Richard Hartshorne, op. cit., p. 142.

tion those phenomena which are significant. The major test of significance in the present study is relationship between city and region. Thus attention is focused upon the physical, cultural, and locational phenomena which led to the development of agriculture in the Red Deer region, and of the city of Red Deer as a regional center.

The concept of the functional region as used here is suitable for an area where there is a close relationship between city and region. It would not be an appropriate method for studying an area of very sparse settlement, nor an area containing several large settlements of approximately the same size. On the other hand, the concept of the "geographic region", with easily distinguishable physical or cultural boundaries, does not provide a suitable method for studying the Red Deer region or Central Alberta at the desired scale. Thus it may be said that there is no single concept of regional geography that is universally applicable to all areas and all phenomena which the discipline may legitimately encompass.

In conclusion, it should be added that the Red Deer region as delimited here is not static but dynamic. The ties between city and region may be expected to strengthen as a result of intensification of agriculture, growth of the city, and the establishment of more regionally based industries.

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# APPENDIX

## MAP SOURCES

The base for all of the folded maps was traced from a map of the Province of Alberta at a scale of one inch to eight miles.[1] The boundaries of the map were extended far enough to show the context of the Red Deer region. The grid of the land survey system was included for reference. In the third survey system, used in the three Prairie Provinces, Townships six miles square (abbreviate Twp.) are numbered consecutively northward from 49° N. Lat., the Canada-U. S. boundary. For east-west reference the columns of Townships are described as Ranges (abbreviated Rge.) and numbered consecutively westward from every fourth meridian of longitude. In the map-area shown these include 110° W. Long., which is the Alberta-Saskatchewan boundary and is known as the Fourth Meridian; and 114° W. Long., known as the Fifth Meridian. Ranges located between the Fourth and Fifth Meridians are described as West of the Fourth Meridian (abbreviated W. 4 M.). The base also includes the boundaries of various Indian Reserves, of part of the Clearwater Forest Reserve to the west of the Red Deer region, and of parts of Banff and Jasper National Parks to the west of the Forest Reserve.

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[1] Alberta, Department of Lands and Forests, Technical Division, Province of Alberta, 1 inch to 8 miles, Edmonton, 1955.

Sepia and black line prints of the base map were used to plot Figures 3 to 10, 12, and 14 to 19. These figures were then photographically reduced to a scale of approximately one inch to fourteen miles, and blue line prints were made from the negatives.

Figure 1--Population Growth of Alberta Cities Over 5,000 in 1961

Populations of the eight largest cities in Alberta were plotted on semi-logarithmic paper for the years 1901 to 1961. The only Alberta city excluded was Drumheller, which is comparable in size (1961 population 2,821) though not in function to the smaller towns in Alberta. Data were obtained from the Census of Canada.[2] Figures for the metropolitan areas of Edmonton and Calgary were used for the years 1956 and 1961. Figures for 1961 were preliminary counts, subject to adjustments which usually add approximately one per cent.

Figure 2--Alberta--Cities over 5,000--1961

Preliminary 1961 population counts for the same eight cities were shown by circles of areas proportional to their populations. Sources were the same as for Figure 1.

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[2]Census of the Prairie Provinces, 1936, Vol. I, "Population and Agriculture," Ottawa, 1938; Census of the Prairie Provinces, 1946, Vol. I, "Population," Ottawa, 1949; Ninth Census of Canada, 1951, Vol. I, "Population, General Characteristics," Ottawa, 1953; Census of Canada, 1956, Vol. I, "Population," 1958; Census of Canada, 1961, Preliminary Releases Nos. 1 to 5, July to October, 1961.

Figure 3--The Red Deer Region

Data were obtained by interview[3] on circulation of the Red Deer Advocate by home delivery, mail, and newsstand sales. Total circulation for each post office was then tabulated. The number of householders receiving mail from each post office was tabulated from data obtained from the Canada Post Office.[4] From these figures the percentage of householders receiving the newspaper from each post office was derived and plotted on the base map. A frequency table was made and isopleths of representative percentages were drawn. Percentages below 2.5 were found to be insignificant, since they appeared at widely scattered places outside of Central Alberta, with intervening areas where the newspaper did not circulate.

The areal extent of service by Red Deer's two wholesale grocers was found by interview.[5] The extent of the service was the same for both firms except on the east, where the discrepancy was about twenty-five miles. The maximum limit of service was then drawn on the base map.

The milk shed of the Red Deer condensery of the Central Alberta Dairy Pool was found by interview.[6] Since there

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[3]Red Deer Advocate, interview, Red Deer, February, 1962.

[4]Canada, Post Office Department, The Comptroller's Branch, Directories Section, Numbers of Householders Served by Post Offices and on Rural Routes in the Provinces of Manitoba, Saskatchewan, Alberta, British Columbia, Yukon Territory and Mackenzie River, N. W. T., Ottawa, September, 1961.

[5]Horne and Pitfield Foods Ltd.; and Macdonalds Consolidated Ltd., interviews, Red Deer, February, 1962.

[6]S. Laycraft, Field Man., Central Alberta Dairy Pool, interview, Red Deer, February, 1962.

is no complete map of the routes followed by the milk trucks, the maximum extent of the routes was mapped.

Figure 4--Central Alberta--Geological Map

The major geological boundaries shown for the eastern part of the map-area are those mapped by the Geological Survey of Canada.[7] The boundaries shown for the Rocky Mountains and the Rocky Mountain Foothills are those mapped by D. F. Stott.[8]

Figure 5--Central Alberta--Relief and Hydrography

Hydrography was traced from the Alberta map used for the base map. Contour lines were taken from various topographic maps of the Department of Mines and Technical Surveys, Ottawa, at the largest scale available for each part of the map-area except the mountainous area. Maps at a scale of 1 to 50,000 were available for most of the central area. Maps at 1 to 250,000 were available for most of the eastern part, though no contour maps have been issued for a small area in the southeast. Maps at a scale of 1 to 506,880 were used for the western area. The pre-glacial valley of the Red Deer

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[7] Canada, Department of Mines and Technical Surveys, Geological Survey of Canada, Geological Map of Alberta, Map 1002A, 1951.

[8] D. F. Stott, The Alberta Group, Rocky Mountain Foothills, Alberta, Paper 56-1, Geological Survey of Canada, Ottawa, 1956, p. 71.

River was mapped from Stalker.[9]

Figure 6--The Red Deer Region--Profiles

Profiles were drawn from the same topographic maps used for Figure 5, at a horizontal scale of 1 to 50,000 and a vertical scale of 1 to 3,000 (vertical exaggeration 16.67 to 1). They were then reduced by pantograph to the scale of the base map.

Figure 7--The Red Deer Region--Soils

Soil zones for Central Alberta were drawn from the most recent map of the Alberta Soil Surveys.[10] More detailed information on the soils of the Red Deer Region was obtained from various reports of the Alberta Soil Survey.[11] Because the reports were issued over a period of twenty-two years, the classifications and methods used vary considerably from

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[9]A. MacS. Stalker, Surficial Geology of the Red Deer-Stettler Map-Area, Alberta, Canada, Department of Mines and Technical Surveys, Geological Survey of Canada, Memoir 306, Ottawa, 1960, p. 18.

[10]Alberta Soil Surveys, Soil Zones of Alberta, arranged and drawn by Wm. Odynsky, Research Council of Alberta, Edmonton, 1962.

[11]W. E. Bowser et al., Soil Survey of Peace Hills Sheet, University of Alberta Bulletin No. 48, Report No. 14 of the Alberta Soil Survey, Edmonton, 1947; W. E. Bowser, T. W. Peters, and J. D. Newton, Soil Survey of Red Deer Sheet, University of Alberta Bulletin No. 51, Report No. 16 of the Alberta Soil Survey, Edmonton, 1951; T. W. Peters and W. E. Bowser, Soil Survey of Rocky Mountain House Sheet, University of Alberta Bulletin No. SS-1, Alberta Soil Survey Report No. 19, Edmonton, 1960; F. A. Wyatt et al., Soil Survey of Rosebud and Banff Sheets, University of Alberta Bulletin No. 40, Edmonton 1943; F. A. Wyatt et al., Soil Survey of Sullivan Lake Sheet, University of Alberta Bulletin No. 31, Edmonton, 1938.

one report to another. In order to combine the source material into one map at the desired scale, parent material of soils was chosen as a characteristic which was treated in a similar manner in all the reports.

Figure 8--Central Alberta--Climate

Data for the six graphs of temperature and precipitation were obtained from records of the Department of Transport.[12] Data from the same source on mean annual precipitation were plotted for twenty-one stations, and isohyets were drawn. An attempt was made to compensate for known anomalies, and to avoid interpolation on a detailed scale. The lines shown for the mean annual frost-free period are from a map published by the Department of Transport,[13] and the line for mean annual degree-days above 42°F. is from the Atlas of Canada.[14]

Figure 9--Central Alberta--Natural Vegetation

The vegetational classifications and boundaries used

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[12]Canada, Department of Transport, Meteorological Branch, Temperature and Precipitation Normals for Canadian Weather Stations Based on the Period 1921-1950, Cir. 3208 Cli. - 19, 1959.

[13]C. C. Boughner, R. W. Longley, and M. K. Thomas, Climatic Summaries for Selected Meteorological Stations in Canada, Vol. III, "Frost Data," Canada, Department of Transport, Meteorological Division, Toronto, 1956.

[14]Canada, Department of Mines and Technical Surveys, Geographical Branch, Atlas of Canada, Ottawa, 1957.

were modelled after those of E. H. Moss,[15] with modifications from other sources. The parkland-mixed forest boundary is that delimited by Charles Bird.[16] The western boundary of the mixed forest was derived from a forestry map of Alberta.[17]

Figure 10--The Red Deer Region--Farm Population Density--1956

Census data on farm population for 1956 were plotted by census subdivision.[18] Data listed by township were not used, since they include population of unincorporated settlements. Data from the 1961 census are not yet available by census subdivision.

Figure 11--Population Growth in the Red Deer Region--Settlements over 2,000 in 1961

Data were obtained from the same sources as for Figure 1 and plotted on semi-logarithmic paper.

Figure 12--Central Alberta--Nucleated Settlements

Locations of settlements were traced from the map of Alberta at one inch to eight miles. Approximate boundaries

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[15] E. H. Moss, "The Vegetation of Alberta," The Botanical Review, Vol. XXI, No. 9, November, 1955, pp. 493-567.

[16] Charles Bird, unpublished map, University of Alberta, Edmonton, 1962.

[17] Alberta, Department of Lands and Forests, Forest Classification, 1 inch to 16 miles, Edmonton, 1957.

[18] Census of Canada, 1956, Bulletin 2-9, "Agriculture, Alberta," Ottawa, 1957.

for the cities of Wetaskiwin, Camrose, and Red Deer were obtained from topographic and city maps at larger scales. Circles of areas proportional to the populations of the incorporated settlements[19] were drawn, using the same census sources as for Figure 1. It should be noted that some settlements shown as Post Offices may be larger than the smallest settlements shown as Villages. However, census data are available only for incorporated settlements.

Figure 13--1961 Population of Incorporated Settlements in Central Alberta

Sources were the same as for Figure 1.

Figure 14--Central Alberta--Population Density--1956

Sources were the same as for Figure 1. Totals for rural and urban population were plotted for each township. Density per square mile was then derived and plotted for each township. A frequency table was made, and representative isopleths were chosen and drawn, taking some account of the locations of settlements. Populations of Indian Reserves were available only as total for census subdivisions, and hence a uniform density was assumed for all Indian Reserves within each subdivision. The map was prepared from 1956 figures because 1961 figures are not yet available for indivi-

[19] Incorporated settlements are those having some form of organized local government, that is Villages, Towns, and Cities. These designations indicate the form of local government, but are not intended to imply a functional classification.

dual townships.

Figure 15--Central Alberta--Railways and Highways

Information was obtained from the map of Alberta at one inch to eight miles, various road maps, and personal observation.

Figure 16--The Red Deer Region--Census Subdivisions--1956

Boundaries were obtained from the census map for Alberta.[20] This figure was included for reference purposes in connection with Table 3 and Table 4.

Figure 17--Central Alberta--Defined Oil and Gas Fields

The location and extent of defined oil and gas fields were obtained from a map supplied by the Department of Mines and Minerals, and drawn from information compiled by the Oil and Gas Conservation Board.[21] Only the fields whose limits have been defined by the Board are shown. Undefined fields are widely scattered, but few are more than one or two square miles in area.

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[20] Census of Canada, 1956, Bulletin 2-9, "Agriculture, Alberta," Ottawa, 1957.

[21] Alberta, Department of Mines and Minerals, Oil and Gas Fields, Alberta, 1 inch to 16 miles, Edmonton, February 1, 1962.

Figure 18--Administrative Districts Centered on Red Deer

The boundaries shown were obtained from interviews.[22]

Figure 19--C. A. D. P. Creameries

The locations of the creameries of the Central Alberta Dairy Pool were found by interview.[23]

Figure 20--Extra-Regional Distribution from Red Deer

The areal extent of extra-regional distribution of farm machinery, automotive parts, and beer from Red Deer was determined by interview.[24]

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[22]National Employment Service; Alberta, Department of the Attorney General; Royal Canadian Mounted Police; interviews, Red Deer, February, 1962.

[23]S. Laycraft, Field Man., Central Alberta Dairy Pool, interview, February, 1962.

[24]Nance Co.; Chrysler Corp.; Carling Breweries; interviews, Red Deer, February, 1962.

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